NAIF ARAB UNIVERSITY
FOR SECURITY SCIENCES
Est. 1978

جامعة نايف العربية
للعلوم الأمنية
تأسست ١٩٧٨

ASFSFM 2025

THE SEVENTH INTERNATIONAL CONFERENCE

OF THE ARAB SOCIETY FOR FORENSIC SCIENCES & FORENSIC MEDICINE

Innovative Forensic Sciences for Sustainable Security

2nd to 4th
Dec. 2025

ABSTRACT BOOK

Guide digital Copy

NAUSS campus

Conference portal

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Naif Arab University for Security Sciences
Riyadh.

ABSTRACT BOOK

الجمعية العربية لعلوم الأدلة الجنائية والطب الشرعي
Arab Society for Forensic Sciences and Forensic Medicine

Contents

Scientific Program

The Seventh International Conference of the Arab Society for Forensic Sciences and Forensic Medicine, ASFSFM 2025

Conference Organizer

Naif Arab University for Security Sciences

Conference Date and Venue

The conference will be held from 2nd to 4th December 2025, in the university headquarters in Riyadh, Saudi Arabia.

Conference Objectives

The conference seeks to achieve the following objectives

- **Showcase innovative technologies applied in different fields of Forensic Sciences.**
- **Build collaborations among forensic scientists, universities, and law enforcement, allowing exchange of knowledge and technical expertise in Forensic Sciences & Medicine.**
- **Explore how cross disciplinary research can help forensic casework in given frameworks through ensuring quality and standardization in various forensic disciplines.**

Conference Tracks

The conference will address the scientific, technical, and legal developments in each of the following main tracks:

- Forensic Genetics Track
- Forensic Toxicology/Chemistry Track
- Forensic Medicine/Pathology Track
- Cybercrimes and Digital Forensics Track
- Criminalistics Track
- Artificial Intelligence & Machine Learning in Forensic Investigations Track

The conference will cover the following specializations:

Forensic Science, Forensic Medicine, Criminal Justice and Criminal Law, Criminology, Forensic Dentistry, Forensic Toxicology, Counterfeiting and Forgery, Forensic Biology, Forensic Chemistry, Cybercrime and Digital Forensic Evidence, Crime Scene and Crime Scene Science, Anthropology, Crises and Disasters.

Speakers

Conference speakers will include experts, researchers and academics from universities and various research centers, specialists working in forensic departments, forensic medicine, forensic laboratories, specialists from forensic agencies and legal consultants in the fields of forensic sciences, forensic medicine and criminology.

Participants

The conference targets participants from various entities in addition to specialists in the fields of forensic science, forensic medicine, criminology and relevant fields, especially personnel of departments of forensic evidence, forensic medicine, and forensic laboratories. In addition to personnel of ministries of interior in Arab countries, other relevant ministries, universities, research centers, communication institutions, competent authorities, law enforcement agencies, members of the Arab Society for Forensic Science and Forensic Medicine and the specialized Arab and international societies.

Scientific Committee

Prof. Sayed Sibte Hadi, Chairman
Naif Arab University for Security Sciences

Dr. Abdul Razzak Almorjan
Naif Arab University for Security Sciences

Dr. Abdul Aziz Aldalgan
Chief Toxicologist, Consultant- Security Forces Hospital

Dr. Huda Hasan
Chief Toxicologisy, King Faisal Specialist Hospital

Major General Eid Al-Awaihan
Director of the General Department of Criminal Evidence

Dr. Majed Alshamaileh
Director General at the National Institute of Forensic Medicine

Maj Gen Ahmed Thani Bin Ghulaita AlMeheiri
Director General of Dubai Police, Department of Forensic Sciences & Criminology

Prof. Claude Roux
Forensic Intelligence/Trace-Director of the Centre For Forensic Sciences, University of Technology Sydney

Prof Barry Logan
Toxicologist-Chief Scientist NMS Labs-Director of the Centre of Forensic Education & Research

Prof. Allan Jameison
Forensic Scientist-Director Forensic Science Institute Strathclyde University

Prof. Walther Parson
Forensic Geneticist-Innsbruck Medical University

Prof. Niamh Nic Daeid
Director Leverhulme Research Centre for Forensic Science, University of Dundee

Prof Ralph Bouhaider
Professor Forensic PathologyEdinburg University

Prof Zeno Geradts
Chair Forensic data science-University of Antwrep-Amsterdam

Dr. Kirk Yeager
Chief Scientist in Explosives FBI laboratory

Dr. Mehdi Ben Khelil
Head of Department-Legal Medicine-University of Tunis Almanar

Dr Magdy Alkharoshah
Cheif Editor Egyptian Journal of Forensic Sciences & a consultant at Forensic Medical Centre Dammam

Prof. Pamela Marshall
Forensic Scientist, Dusquene University

Dr. Mohamed Albajah
Committee Secretary

Administrative Coordination

The Conference Administration Department at Naif Arab University for Security Sciences (NAUSS) shall undertake the administrative coordination.

Administrative Coordinator

The Events Management Department
Mr. Nasser Falah Al-Qahtani
Mob.No.: +966545478882
E-mail: Asfsfm_cr@nauss.edu.sa

Day One | Tuesday 02/12/2025

08:00 - 10:00	**Registration**
10:00 - 10:20	**Opening Ceremony (Hall A)**

10:20 - 11:35	**Plenary Session 1 (Hall A)**
	Oral Presentations (OP), OP1 - OP3
11:35 - 12:30	**Lunch Break, Exhibition and Poster Vieweing Sessions**

12:35 - 14:15	**Plenary Session 2 (Hall A)**
	Oral Presentations (OP), OP4 - OP7

Workshops	14:30 - 16:30	Venue
Disaster Victim Identification-Pitfalls and Pearls		Training Deputyship: Lab 1
Sketching the unknown: Forensic DNA Phenotyping (FDS) in practice		Training Deputyship: Lab 4
Artificial Intelligence and Machine Learning Applications in Forensic Sciences: Concepts, Tools, and Emerging Trends		Training Deputyship: Lab 5
Methamphetamine in Focus: Scientific and Forensic Implications		External Relations Deputyship: Hall C

Day Two | Wednesday 03/12/2025

09:00 - 10:35	Session 3 (Hall B)	Session 4 (Hall A)	Session 5 (Hall C)
	Innovative Applications in Forensic Genetics OP8 - OP11	Designer Drugs: The New Wave OP12 - OP15	Artificial Intelligence OP16 - OP19
10:35 - 11:00	**Tea Break, Exhibition and Poster Viewing Sessions**		
11:00 - 12:10	**Session 6 (Hall B)**	**Session 7 (Hall A)**	**Session 8 (Hall C)**
	Advancements in Forensic Genetics OP20 - OP22	Novel Forensic Analytical Approaches OP23 - OP25	Forensic Rule Book OP26 - OP29
12:15 - 12:40	**Lunch Break, Exhibition and Poster Viewing Sessions**		
12:50 - 14:25	**Session 9 (Hall B)**	**Session 10 (Hall A)**	**Session 11 (Hall C)**
	Cybercrimes & AI OP30 - OP33	Forensic Medicine OP34 - OP37	Marks & Traces OP38 - OP41

Workshops	**14:30 - 16:30**	**Venue**
The Use of Virtual Reality in Crime Scene Training and Investigation		**Training Deputyship: Class 1**
Revealing the Invisible: The Crucial Role of Trace Evidence		**External Relations Deputyship: Hall B**
Integrating Cybersecurity and AI: Tackling Cybercrime with Machine Learning		**Training Deputyship: Lab 4**

Day Three | Thursday 04/12/2025

09:00 - 10:35	Session 12 (Hall B)	Session 13 (Hall A)	Session 14 (Hall C)
	Disaster Victim Identification OP42 - OP45	Forensic Toxicology OP46 - OP49	Forensic Pathology & Anthropology OP50 - OP53
10:35 - 11:00	Tea Break, Exhibition and Poster Viewing Sessions		
11:00 - 12:10	Session 15 (Hall B)	Session 16 (Hall A)	Session 17 (Hall C)
	Forensic Genetics OP54 - OP56	Innovations in Drugs & Seized Material Analysis OP57 - OP59	Forensic Chemistry OP60 - OP62
12:15 - 12:50	Lunch Break, Exhibition and Poster Viewing Sessions		
13:00 - 13:45	Session 18 (Hall B)	Session 19 (Hall A)	Session 20 (Hall C)
	Forensic Science & Law OP63- OP65	Forensic Toxicology - Diversified OP66 - OP68	Forensic Entomology OP69 - OP71
13:50 - 14:20	Closing Ceremony (Hall A)		

Workshops	14:30 - 16:30	Venue
Tracing and Analyzing Illicit Cryptocurrency Transactions		Training Deputyship: Lab 4
Creative Thinking Skills in Criminal Investigation		Training Deputyship: Lab 1
QA and QC for Fingerprint Labs: Pathway Towards Accreditation		External Relations Deputyship: Hall C
Workplace Drug Testing - Challenges & Quality		External Relations Deputyship: Hall B

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Conference Program

Day One

Tuesday 02/12/2025

OP (Oral Presentation)

10:20 - 11:35	Plenary Session 1 (Hall A)
Moderator	Prof. Osama Mohammad ALmadani
Senior Consultant in Medicolegal Medicine, Ministry of Health, Saudi Arabia	
OP 1	
Title	Evolution of Improvised Explosives Utilized Globally From Battlefield to Cityscape
Speaker	Dr. Kirk Yeager
Affiliation	Federal Bureau of Investigation, USA
OP 2	
Title	Components of Emerging Drug Threats: Early Warning Systems and the Role of Forensic Laboratories
Speaker	Dr. Barry K Logan
Affiliation	Vice President & Chief Scientist, NMS Laboratory, USA

OP 3	
Title	From Forensics to Forensic Science: Traces, Signs and Scientific Methods
Speaker	Prof. Claude Roux
Affiliation	University of Technology, Sydney
12:35 - 14:15	**Plenary Session 2 (Hall A)**
Plenary Session 2	
Moderator	Prof. Michelle R. Peace
Department of Forensic Science, Virginia Commonwealth University, Virginia , USA	
OP 4	
Title	The Impact of AI on Forensic Science, Law and Justice
Speaker	Prof. Niamh Nic Daeid
Affiliation	Leverhulme Research Centre for Forensic Science, University of Dundee, UK

OP 5	
Title	The Response of Dubai Police Forensic Department in DVI Operations During the Derna Flood Catastrophe
Speaker	Major General Ahmad Thani Bin Ghulaita Al Mheiri
Affiliation	Dubai Police Forensic Science and Criminology Department, Dubai, UAE
OP 6	
Title	An Update on CBRN: The Scottish Experience
Speaker	Prof. Ralph BouHaidar
Affiliation	University of Edinburgh, UK
OP 7	
Title	DNA Transfer: Research Implications for Casework
Speaker	Prof. Allan Jameison
Affiliation	Forensic Institute, Glasgow, UK

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Day Two

Wednesday 03/12/2025

OP (Oral Presentation)

09:00 - 10:35	Session 3 (Hall B)
Innovative Applications in Forensic Genetics	
Moderator	Prof. Allan Jameison
	Forensic Institute, Glasgow, UK
OP 8	
Title	Unravelling Unique (epi)genomic Signatures in Forensics
Speaker	Dr. Athina Vidaki
Affiliation	University of Maastricht, The Netherlands
OP 9	
Title	Why “One Size Fits All” Doesn’t Work in Forensic DNA Analysis: Rethinking Strategies for Compromised Samples
Speaker	Dr. Yogesh Prasad
Affiliation	Biosecure ID, UK

OP 10	
Title	Precision Forensics: Integrating Artificial Intelligence and Predictive Analytics in the Interpretation of DNA Evidence
Speaker	Dr. Noora R. Al-Snan
Affiliation	Forensic DNA lab, Directorate of Forensic Science, Manama, Bahrain
OP 11	
Title	DNA Database Utility in Resolving Complex Paternity Disputes
Speaker	Colonel Shakhawan Khalid Mawlood
Affiliation	Directorate of Forensic Investigation, Ministry of Interior, KRG, Iraq

09:00 - 10:35	Session 4 (Hall A)
Designer Drugs: The New Wave	
Moderator	Dr. Barry Logan
Vice President & Chief Scientist, NMS Laboratory, USA	
OP 12	
Title	How to Interpret NPS Findings in Hair?
Speaker	Dr. Alberto Salomone
Affiliation	Dipartimento di Chimica, Università degli Studi di Torino, Turin, Italy
OP 13	
Title	Short- and Long-Term Stability of Synthetic Cathinones and Dihydro-Metabolites in Human Whole Blood and Urine Samples
Speaker	Dr. Abdulaziz AlDhubyan
Affiliation	Prince Sultan Military Medical City, Riyadh, Saudi Arabia

OP 14	
Title	Emerging Challenges in New Psychoactive Substance (NPS) Detection and Control in Saudi Arabia
Speaker	Dr. Ahmed Al Asmari
Affiliation	King Faisal Special Hospital and Research Center, Riyadh, Saudi Arabia
OP 15	
Title	Emerging Novel Psychoactive Substances in Seized Materials: Evidence from Southern Saudi Arabia
Speaker	Dr. Abdul Rehman AlAssiri
Affiliation	Asir Forensic Toxicology Services, Saudi Arabia

09:00 - 10:35	Session 5 (Hall C)
Artifical Intelligence	
Moderator	Prof. Tanveer Zia
School of Arts and Sciences, University of Notre Dame, Australia	
OP 16	
Title	DFIR 2.0: Reinventing Digital Forensics in the Era of Multi-Agentic AI Systems
Speaker	Prof. Mohammed Abdur Rahman
Affiliation	Cyber Security and Forensic Computing Department, University of Prince Mugrin (UPM), Madina, Saudi Arabia
OP 17	
Title	Deep Learning-Based Forensic Detection of Suspicious Activities in CCTV Systems
Speaker	Dr. Qazi Emad Ul Haq
Affiliation	Naif Arab University for Security Sciences, Riyadh, Saudi Arabia

OP 18	
Title	Beyond the Hash Value: An AI-Powered Triage Framework in the Fight Against Child Exploitation
Speaker	Dr. Kashif Saleem
Affiliation	Center of Excellence in Information Assurance, King Saud University, Riyadh, Saudi Arabia
OP 19	
Title	AI-Driven Forensics Framework for Reliable Detection of Ransomware
Speaker	Mr. Mohamed Almunajem
Affiliation	Department of Cybersecurity and Digital Forensics, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia

11:00 - 12:10	Session 6 (Hall B)
Advancements in Forensic Genetics	
Moderator	Dr. William Goodwin
University of Lancashire, Lancashire, UK	
OP 20	
Title	Forensic DNA Phenotyping: From Routine Casework and Historical Cases to Single-Cell Analysis
Speaker	Dr. Marta Dipenbroek
Affiliation	Institute of Legal Medicine LMU Munich, Germany
OP 21	
Title	De Novo Reconstruction of 3D Human Facial Images From DNA Sequence
Speaker	Prof. Fan Liu
Affiliation	College of Forensic and Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia

OP 22	
Title	Does Ethnicity Influence DNA Transfer Efficiency?
Speaker	Dr. Bushra Idris
Affiliation	American University of Ras Alkhaima, Ras Alkhaima, UAE

11:00 - 12:10	Session 7 (Hall A)
Novel Forensic Analytical Approaches	
Moderator	Dr. Ahmed Al Asmari
Special Toxicological Analysis Section, Pathology and Laboratory Medicine Division, King Faisal Special Hospital and Research Center, Riyadh, Saudi Arabia	
OP 23	
Title	Why Some People “Green Out”? The Analysis of Unregulated “Hemp-Derived” Cannabis Products in the United States
Speaker	Prof. Michelle R. Peace
Affiliation	Department of Forensic Science, Virginia Commonwealth University, Virginia , USA
OP 24	
Title	Unmasking the Cause of Death: The Critical Role of Sample Zero in Forensic Toxicology
Speaker	Dr. Fuad Ali Tarbah
Affiliation	General Department of Forensic Science and Criminology, Dubai Police GHQ, UAE

OP 25	
Title	Qualitative Analysis for Synthetic Cannabinoids in Randomly Collected Urine Specimens and Seized Samples
Speaker	Mr. Faisal Al Taneji
Affiliation	Drug Surveillance Center, General Department of Forensic Science and Criminology, Dubai Police GHQ, Dubai, UAE

11:00 - 12:10	Session 8 (Hall C)
Forensic Rule Book	
Moderator	Col. Dr. Saeed Al-Ghamdi
General Administration of Forensic Evidence, Ministry of Interior, Saudi Arabia	
OP 26	
Title	Developing a Curriculum for Training on Radiological Sources Security for African Universities and Industries
Speaker	Prof. Mostafa Kofi
Affiliation	Prince Sultan Military Medical City, Riyadh, Saudi Arabia
OP 27	
Title	Regulatory Challenges to Investigating AI-Driven Cybercrimes
Speaker	Mr. Naeem AllahRakha
Affiliation	Tashkent State University of Law, Uzbekistan

OP 28	
Title	Forensic Document Examination in Criminal Justice: Scientific Tools, Courtroom Admissibility and Challenges- A Case Study
Speaker	Mr. Syed Aizaz Ali Shah
Affiliation	Department of Criminology, University of Peshawar, Pakistan
OP 29	
Title	The State of Forensic Science in Palestine: Infrastructure, Education, and Legal Frameworks
Speaker	Mr. Walid M. Khalilia
Affiliation	Al Istiqlal University, Palestine

12:50 -14:25	Session 9 (Hall B)
Cybercrimes & AI	
Moderator	Dr. Kyounggon Kim
College of Forensic & Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia	
OP 30	
Title	Cybersecurity for Smart Mobility: Challenges and Research Frontiers
Speaker	Prof. Muhammad Khurram Khan
Affiliation	Center of Excellence in Information Assurance, King Saud University, Riyadh, Saudi Arabia
OP 31	
Title	Balancing Technology Innovation and Ethics: Navigating the Ethical Impacts of AI Advancements
Speaker	Prof. Tanveer Zia
Affiliation	School of Arts and Sciences, University of Notre Dame, Australia

OP 32	
Title	Hybrid Decision-Fuzzy Reasoning for Financial Fraud Detection in Fintech Forensics
Speaker	Prof. Saad M. Darwish
Affiliation	Pharos University, Alexandria, Egypt
OP 33	
Title	Secure Edge Intelligence for Forensic IoT Devices Through TinyFL-Chain with Federated TinyML and Blockchain
Speaker	Prof. Nidal Nasser
Affiliation	College of Engineering & Advanced Computing, Alfaisal University, Riyadh, Saudi Arabia

12:50 -14:25	Session 10 (Hall A)
Forensic Medicine	
Moderator	Dr. Faisal Al Zubaidi
King Fahad Security College, Riyadh, Saudi Arabia	
OP 34	
Title	Medical Liability Law in Jordan and Beyond: A Forensic View
Speaker	Dr. Majed Alshamaileh
Affiliation	National Institute of Forensic Medicine, Jordan
OP 35	
Title	Age Estimation from Ossification of the Medial Clavicular Epiphysis by Computed Tomography
Speaker	Prof. Doaa Abdel Wahab El Morsi
Affiliation	Delta University for Science & Technology, Egypt

OP 36	
Title	Forensic Medical Aspects of Child Abuse: A Prospective Study of 159 Cases in Algiers
Speaker	Prof. Sofiane Haroual
Affiliation	University of Health Sciences of Algiers, Algeria
OP 37	
Title	Characteristics of Homicidal Cut-throat Injuries
Speaker	Dr. Abualeme Almotazbellah
Affiliation	National Institute of Forensic Medicine, Ministry of Health, Amman, Jordan

12:50 -14:25	Session 11 (Hall C)
Marks & Traces	
Moderator	Prof. Claude Roux
University of Technology Sydney, Australia	
OP 38	
Title	Means, Opportunity, and Motive: The Timeless Trifecta of the Bomber
Speaker	Dr. Kirk Yeager
Affiliation	Federal Bureau of Investigation, Washington, D.C., United States
OP 39	
Title	Quantitative Measurement of Toolmarks on Bones
Speaker	Maj. Mohammad A. AlShamsi
Affiliation	General Department of Forensic Science and Criminology, Dubai Police GHQ, UAE

OP 40	
Title	Gelatin Hydrogels for Efficient Recovery of Organic Explosive Residues: A Forensic Approach
Speaker	Mr. Khalid Sajjad Feras
Affiliation	College of Forensic and Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia
OP 41	
Title	Techniques for Restoring Fingerprints From Human Remains Exposed to Extreme Heat: Challenges and Modern Approaches
Speaker	Col. Dr. Saeed Al-Ghamdi
Affiliation	General Administration of Forensic Evidence, Ministry of Interior, Saudi Arabia

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Day Three

Thursday 04/12/2025

OP (Oral Presentation)

09:00 - 10:35	Session 12 (Hall B)
Disaster Victim Identification	
Moderator	Dr. Yahya Khubrani
General Administration of Forensic Evidence, Ministry of Interior, Saudi Arabia	
OP 42	
Title	Global Unity in Crisis: INTERPOL's Role in Disaster Victim Identification
Speaker	Mr. Charles Lamens
Affiliation	INTERPOL, Lyon, France
OP 43	
Title	Ethical Perspectives and Attitudes of Disaster Management Workers in the Middle East
Speaker	Prof. Marwa M Fawzi
Affiliation	Faculty of Medicine, Al-Rayan National Colleges, Medina, Saudi Arabia

OP 44	
Title	Fingerprint-Based Strategies for Mass Disaster Victim Identification
Speaker	Mr. Akbar Ali
Affiliation	College of Forensic and Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia
OP 45	
Title	Operation Logan: Identification of Human Remains Discovered After a Major Fire
Speaker	Mr. Robert Gallagher
Affiliation	College of Forensic and Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia

09:00 - 10:35	Session 13 (Hall A)
Forensic Toxicology	
Moderator	Dr. Alberto Salomone
Department of Chemistry, University of Turin, Turin, Italy	
OP 46	
Title	Toxicological Findings in 6,051 Drug-Facilitated Crime Casework: Scope, Patterns, and Interpretation
Speaker	Dr. Barry Logan
Affiliation	NMS Laboratory, USA
OP 47	
Title	Tiny Bodies, Big Mysteries: Interpreting Toxicology in Paediatric Deaths
Speaker	Prof. Nikolas Lemos
Affiliation	Queen Mary University of London, UK

OP 48	
Title	An Innovative Polar Gas Phase Approach for the Analysis of Amphetamines and Cathinones Using GC-MS
Speaker	Dr. Khaled Masoud
Affiliation	College of Forensic and Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia
OP 49	
Title	Stability of Ethanol and Common Volatiles in Blood: The Influence of Preservatives, Antioxidants, and Storage Conditions
Speaker	Dr. Huda Hasan
Affiliation	IVD Laboratory and Toxicology Services, Riyadh, Saudi Arabia

09:00 - 10:35	Session 14 (Hall C)
Forensic Pathology & Atnthrology	
Moderator	Prof. Ralph BouHaidar
	University of Edinburgh, UK
OP 50	
Title	Medico-Legal Aspects of Suicidal Bomb Attacks
Speaker	Prof. Rohan Ruwanpura
Affiliation	National Hospital Galle, Sri Lanka
OP 51	
Title	An Autopsy Study of Ligature Mark in 634 Cases of Suicidal Hangings
Speaker	Prof. Dinesh Rao
Affiliation	Forensic Medicine, AIIMS, Jammu, India
OP 52	
Title	Intrafamilial Homicides in the Region of Laghouat: A 15-Year Medico-Legal Study
Speaker	Dr. Massinissa Benyagoub
Affiliation	Faculty of Medicine, University of Laghouat, Algeria

OP 53	
Title	Forensic Archaeology and Anthropology in ICMP: The Iraq Program
Speaker	Miss. Nicole Lambacher
Affiliation	International Commission of Missing Persons (ICMP), Hague, Netherlands

11:00 - 12:10	Session 15 (Hall B)
Forensic Genetics	
Moderator	Prof. Fan Liu
College of Forensic and Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabi	
OP 54	
Title	Technical Challenges in Undertaking Large-scale Identification Following Disasters and Conflicts
Speaker	Dr. William Goodwin
Affiliation	University of Lancashire, Lancashire, UK
OP 55	
Title	ICMP DNA Laboratories: Supporting Missing Persons Investigations
Speaker	Mr. Kieren Hill
Affiliation	International Commission of Missing Persons (ICMP), Hague, Netherlands

OP 56	
Title	Unveiling DNA at Crime Scenes Using Nano-Sensing Technology
Speaker	Colonel Khalid Alzahrani
Affiliation	General Administration of Forensic Evidence, MOI, Riyadh, Saudi Arabia

11:00 - 12:10	Session 16 (Hall A)
Innovations in Drug & Seized Material Analysis	
Moderator	Dr. Fuad Tarbah
General Department of Forensic Science and Criminology, Dubai Police GHQ, United Arab Emirates	
OP 57	
Title	Detection of Etomidate-Class Psychoactives in a Seized Powder: Forensic Confirmation of Anaesthetic-Derived Substances
Speaker	Prof. Astha Pandey
Affiliation	School of Forensic Science, National Forensic Sciences University, Gandhinagar, Gujarat, India
OP 58	
Title	Automated Impurity Profiling of Gas Chromatography-Mass Spectrometry Methylamphetamine Data Using R Scripts
Speaker	Dr. Alasoul Saif
Affiliation	Leverhulme Research Centre for Forensic Science, School of Science and Engineering, University of Dundee, Dundee, UK

OP 59	
Title	Through a New Lens: Diclazepam's, a Designer Benzodiazepine, Forensic Profiling Using an Alternative Model
Speaker	Miss. Raneem Essam Moustafa
Affiliation	University of Sharjah,Sharjah , UAE

11:00 - 12:10	Session 17 (Hall C)
Forensic Chemistry	
Moderator	Dr. Farouq Alzahrani
Ministry of Interior, Saudi Arabia	
OP 60	
Title	Classification of Cannabis in Morocco: The Importance of Laboratory Analyses in Distinguishing Legal and Prohibited Uses
Speaker	Dr. Hakima Yahya
Affiliation	Minsitry of Interior, Morocco
OP 61	
Title	Unmasking Hidden Chemical Warfare Agents From Novel Phenol-Derived Reaction Products
Speaker	Dr. Gavash Harsha Kannikanti
Affiliation	College of Forensic and Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia

OP 62	
Title	Soil Contamination From Military Activities in South Lebanon: Forensic Investigation
Speaker	Mr. Karim Hassan Allaw
Affiliation	Lebanese American University, Beirut, Lebanon

13:00 - 13:45	Session 18 (Hall B)
Forensic Science and Law	
Moderator	Prof. Chafik Sarsar
College of Criminal Justice and Criminology, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia	
OP 63	
Title	Persistence in Medical Errors in Private Medical Centers
Speaker	Retired Major General Hammad Manahi Al-Anzi
Affiliation	Affiliation: Security Consultant in Forensic Sciences
OP 64	
Title	The Role of Smart Forensic Science in Uncovering Drug-Related Crimes
Speaker	Dr. Youness Nafid
Affiliation	College of Criminal Justice and Criminology, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia

OP 65	
Title	Integrity of Forensic Evidence: The Role of the Public Prosecutor in Overseeing the Implementation of Ethical and Technical Protocols at the Crime Scene
Speaker	Dr. Muhammed Salamah bani Taha
Affiliation	Public Prosecution, Hashemite Kingdom of Jordan
13:00 - 13:45	**Session 19 (Hall A)**
Forensic Toxicology-Diverse	
Moderator	Dr. Torki Zughaibi
King Abdulaziz University, Jeddah, Saudi Arabia	
OP 66	
Title	Development and Validation of a UPLC-QTOF-MS Method for Blood Analysis of Isomeric Amphetamine-Related Drugs
Speaker	Mr. Ahmad Alamir
Affiliation	Poison Control and Medical Forensic Chemistry Center, Jazan Health Affairs, Ministry of Health, Jazan, Saudi Arabia

OP 67	
Title	Understanding the “Kush” Phenomenon
Speaker	Miss. Marwa Alsuwaidi
Affiliation	Drug Surveillance Centre, Dubai Police, Dubai, UAE
OP 68	
Title	A Case Report of Fatal Topiramate Intoxication: Suicide Overdose
Speaker	Miss. Fatima Mohamed Saeed Bakhit
Affiliation	General Department of Forensic Sciences and Criminology, Dubai Police, Dubai, UAE

13:00 - 13:45	Session 20 (Hall C)
Forensic Entomology	
Moderator	Prof. Sayed Amer
College of Forensic and Investigative Sciences, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia	
OP 69	
Title	Checklist of Carrion Insects and Their Forensic Importance in Southern Nigeria
Speaker	Dr. Maduamaka Cyriacus Abajue
Affiliation	Department of Animal & Environmental Biology, University of Port Harcourt, Nigeria
OP 70	
Title	Thermal Effects on the Longevity, Morphological Characters, and Cuticular Hydrocarbons Composition of Dermestes maculatus Larval Instars
Speaker	Miss. Maryah Abdulssalam AlOufi
Affiliation	King Saud University, Riyadh, Saudi Arabia

OP 71	
Title	Statistics of Drug-Related Crimes in the Arab World
Speaker	Dr. Mahmoud Salamah Alsharief
Affiliation	Fikr (Jusoor) Center for Cultural and Developmental Studies and Consultations, Egypt

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Oral Presentation Sessions

02-04/12/2025

Abstracts

OP (Oral Presentation)

Day 1 - Plenary Session 1 (OP 1)

Title

Evolution of Improvised Explosives Utilized Globally From Battlefield to Cityscape

Author/s

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Abstract

Improvised explosives have been a tool utilized in both wartime and peace. The groups that have turned to these materials often utilize identical chemicals and tactics to weaponize these precursors. The historical evolution of a series of improvised explosives will be presented. A focus will be on the types of explosives utilized to produce large vehicle bombs. Examples of processing techniques to weaponize common commercial products will be explained with examples of how various terrorists/insurgent groups have gravitated towards similar explosives, while others have shifted to more unique materials.

Keywords

Improvised explosives; History; Processing techniques; Unique materials

* Presenting Author

Day 1 - Plenary Session 1 (OP 2)

Title

Components of Emerging Drug Threats: Early Warning Systems and the Role of Forensic Laboratories

Author/s

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Abstract

Emerging drug threats—including synthetic opioids, novel benzodiazepines, and designer stimulants—continue to challenge forensic science, public health, and law enforcement agencies globally. Effective Early Warning Systems (EWS) are essential for identifying and responding to these rapidly evolving drug threats before they cause widespread harm. Key components of EWS include broad surveillance networks, timely laboratory identification of new substances, and rapid information sharing. Data channels that assist with this surveillance include toxicology and seized drug casework, death investigation casework, hospital overdose admissions, and drug seizures from arrests and smuggling operations all serve to capture early signals of emerging threats. Forensic laboratories provide the analytical foundation, employing advanced methods such as liquid chromatography-high resolution mass spectrometry (LC-HRMS) to detect and characterize novel substances. These laboratories also develop and validate methods, collect reference data in overdoses that help create a basis for the interpretation of future cases. Information sharing is equally critical. Forensic laboratories contribute not only information about prevalence and proliferation, but also interpretive data on potency, adulteration, and associated health risks. National and international models, such as NPS Discovery and the EUDA EWS, demonstrate how coordinated laboratory networks can transform case-level data into actionable intelligence. Sustainable EWS require resources for instrumentation, training, and international collaboration. Strengthening the role of forensic laboratories within these systems is vital to improving drug surveillance and safeguarding public health globally.

Keywords

Drug threats; NPS; Early Warning Systems (EWS)

* Presenting Author

Day 1 - Plenary Session 1 (OP 3)

Title

From Forensics to Forensic Science: Traces, Signs and Scientific Methods

Author/s

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Abstract

Forensic science has long stood at a crossroads, facing persistent scrutiny over the robustness of its scientific foundations. Despite the implementation of increasingly rigorous normative frameworks, errors and miscarriages of justice continue to occur. Evaluative studies often focus narrowly on forensic science's judicial contributions, overlooking its critical roles in investigation, intelligence, and broader societal applications. Governments and institutions increasingly expect forensic science to address complex challenges—from natural disasters to human rights violations and gender-based violence. At the same time, rapid societal and organizational changes, such as the decentralization of forensic capabilities (particularly in digital domains), are disrupting the traditional centralized model of forensic practice. These issues are globally relevant, including within the Arab world. The central question emerges: How can forensic science be reframed to meet contemporary demands and move forward? This presentation advocates for a return to foundational principles to re-craft forensic science within a coherent and purpose-driven framework. The Sydney Declaration offers such a foundation, proposing seven guiding principles to unify and anchor a discipline often fragmented and reactive. Increasingly regarded as a semiotic call and a quality compass for forensic science, the Declaration provides momentum and cohesion to ongoing debates. This presentation will highlight recent developments and the growing impact of the Sydney Declaration in shaping the future of forensic science.

Keywords

Forensic sciences; forensic practice; contemporary demands

* Presenting Author

Day 1 - Plenary Session 2 (OP 4)

Title

The Impact of AI on Forensic Science Law and Justice

Author/s

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Abstract

What do we mean by AI? The rapid drive forward in the use of old tools for new challenges is impacting on every aspect of society and at a global level. That it will encroach into the crime scene to courtroom pathway is inevitable, whether it is through implementation in policing, work in the laboratory or in impacting on the deliberations and presentation within the courtroom. We already use mathematical algorithms as tools in the interpretation of biometrics (for example fingerprints, faces, DNA) as well as in the interpretation of chemical and biological traces. But where are the safeguards and guardrails for the use of such tools in the criminal justice system? Should we be worried about the exponential rise of AI tools and how do we prepare for their measured and safe implementation?

Keywords

Artificial intelligence; guardrails; safe justice

Day 1 - Plenary Session 2 (OP 5)

Title

The Response of Dubai Police Forensic Department in DVI Operations During the Derna Flood Catastrophe

Author/s

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Abstract

The catastrophic flooding in Derna, Libya, which occurred during September 2023, resulted in unprecedented devastation, claiming thousands of lives and leaving many more missing. In response, the Dubai Police Forensic Science Department deployed a specialized Disaster Victim Identification (DVI) team comprising ten experts in crime scene investigation, biological and DNA analysis, forensic medicine, and fingerprint identification. Significantly, this marked the appointment of the region's first female forensic doctor and its first female DNA expert specializing in disaster scenarios. A fully equipped mortuary and two family communication centers were established to manage operations effectively. The team successfully identified body parts and human remains from 278 victims and processed 312 missing persons cases. Additionally, a central body parts examination center was created, equipped with 252 refrigeration units, four specialized tables for washing and shrouding victims, and three air-conditioned operational halls. Utilizing advanced forensic technologies, rapid DNA profiling, anthropological assessments, and biometric analysis, the operation demonstrated Dubai Police's commitment to excellence, innovation, and international cooperation. This presentation highlights critical insights, challenges faced, and best practices, aiming to enhance global forensic disaster response protocols and strengthen inter-agency cooperation in mass casualty incidents.

Keywords

DVI, Forensic science, victims, Dubai Police, Derna.

* Presenting Author

Day 1 - Plenary Session 2 (OP 6)

Title

An Update on CBRN: The Scottish Experience

Author/s

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Affiliation

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Abstract

The malicious, intentional or accidental release of Chemical, Biological, Radiological, and Nuclear (CBRN) agents represents a critical public health and security concern due to their high potential for mass casualties, severe morbidity, and long-term mortality. Forensic pathology in the context of CBRN fatalities represents the convergence of high-level threat mitigation and criminal investigation. Unlike standard forensic cases, the primary challenge is the preservation of life, including that of the examination team and public health, followed by the rigorous application of forensic protocols. CBRN incidents are inherently treated as Intensive Mass Fatality Emergencies that require specialized handling under the jurisdiction of the Scottish Fatalities Investigation Unit (SFIU) and the Procurator Fiscal (PF), albeit other agencies are often involved. The goal is to establish the cause and manner of death while securing evidence of the agent itself. This presentation outlines the current approach to and the examination of CBRN deaths within Scotland, discusses recent changes to protocols and personal protection equipment and includes several case reports.

Keywords

Chemical biological and radionuclear deaths, disaster victim identification,

* Presenting Author

Day 1 - Plenary Session 2 (OP 7)

Title

DNA Transfer; Research Implications for Casework

Author/s

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Abstract

As DNA analysis detects smaller and smaller amounts of DNA, and complex mixtures become more commonplace, the issue of transfer becomes increasingly important when attempting to connect DNA to crime. Assessing the mechanism of transfer of DNA is not simple. People leave different amounts of DNA at different times. Furthermore, it is possible for a person to contact an item and leave no detectable DNA. There are many factors that are known or thought to be important, such as type of contact, length of contact, nature of surface, cleanliness of the hand and so on. There is not yet a good scientific way to predict the efficiency or quantity of transfer in real world situations. No one factor is sufficiently quantified in the experiments to date. Even the often-quoted phenomenon of 'shedders and poor shedders' is not so clear. It is not always the last person to have touched an item who will leave the major profile because of such direct transfer. Starting from our review in 2013, This presentation considers whether, and to what extent, the current state of research can answer questions found in casework relating to the transfer of DNA.

Keywords

DNA transfer; Persistence; Shedders; Casework

* Presenting Author

Day 2 - Session 3 (OP 8)

Title

Unravelling Unique (epi)genomic Signatures in Forensics

Author/s

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Abstract

Every person carries a unique biological signature. Traditionally, forensic genetics has employed DNA sequence differences in repetitive DNA to identify individuals with high discrimination power. However, this accounts for only a tiny fraction of what makes us truly unique. Recent advances show that chemical changes to our DNA, known as epigenetic marks, reflect who we are, what we experience, and how we age. This presentation explores how such marks, particularly DNA methylation, can reveal personal traits such as chronological age or lifestyle habits, expanding current possibilities within forensic DNA phenotyping. Additionally, the promise of DNA methylation profiling in uncovering individuality even among identical twins will be discussed. For these advances, both new laboratory and computational tools are needed that improve data quality and interpretation from minute forensic DNA traces. Finally, beyond single marks or genes, our research recently focuses on the 'human repeatome', which comprises half of our genome made up of repetitive elements and is now measurable with long-read sequencing. Together, our research expands the capabilities of forensic DNA analysis towards a more complete understanding of biological identity, with applications that bridge genetics, medicine, and justice.

Keywords

Forensic epigenomics; DNA methylation; Age prediction; Monozygotic twins; Nanopore sequencing

* Presenting Author

Day 2 - Session 3 (OP 9)

Title

Why "One Size Fits All" Doesn't Work in Forensic DNA Analysis: Re-thinking Strategies for Compromised Samples

Author/s

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Affiliation

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Abstract

Forensic DNA laboratories often rely on standardized commercial kits from major suppliers, assuming they will perform reliably across all evidence types based on manufacturer validations. However, these "out-of-the-box" workflows are typically optimized for high-quality reference samples and may underperform when applied to compromised evidence, such as degraded DNA, samples with inhibitors, or those containing non-human material like microbial DNA. As a result, many casework samples are discarded, or yield inconclusive results, contributing to case backlogs and diminishing the evidentiary value of samples. Additionally, the increased need for repeat testing drives up laboratory costs, further straining resources. This study will explore the limitations of conventional extraction and amplification kits and introduce adaptive workflows that utilize specialized reagents and protocol modifications. Data from experiments evaluating various degradation and inhibition models demonstrate that tailored extraction methods, sensitive quantification kits, and amplification strategies are essential for improving allelic recovery.

Keywords

Forensic DNA; Commercial kits; Optimization; Reference samples; Degraded DNA; Microbial DNA

* Presenting Author

Day 2 - Session 3 (OP 10)

Title

Precision Forensics: Integrating Artificial Intelligence and Predictive Analytics in the Interpretation of DNA Evidence

Author/s

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Abstract

The field of forensic science is developing with the integration of artificial intelligence (AI) and predictive analytics into DNA analysis. This study explores how emerging technologies are enhancing the accuracy, efficiency and interpretive power of complex DNA evidence. AI tools are increasingly being used for automated mixture deconvolution, which allows forensic scientists to separate and identify individual DNA contributors in mixed samples. Additionally, predictive models enable phenotype and ancestry inference, offering investigators valuable leads when no suspect matches exist. A major focus of this research is the application of probabilistic genotyping, particularly in challenging cases involving low-template or degraded DNA. These AI-enhanced statistical frameworks provide a more objective assessment of match probabilities compared to traditional methods. Furthermore, the integration of AI into forensic pipelines helps reduce human error, streamline evidence interpretation, and supports real-time decision-making in criminal investigations. However, the adoption of these technologies also raises critical legal and ethical considerations. Key concerns include data privacy, algorithmic transparency, and the need for regulatory oversight to ensure responsible use. By presenting current applications and case examples, this study advocates for a balanced and ethically grounded approach to precision forensics—one that harnesses technological innovation while maintaining scientific rigor and legal accountability.

Keywords

Forensic DNA analysis; artificial intelligence; predictive analytics; probabilistic genotyping

* Presenting Author

Day 2 - Session 3 (OP 11)

Title

DNA Database Utility in Resolving Complex Incestuous Paternity Disputes

Author/s

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Abstract

Incestuous paternity cases present significant challenges for forensic scientists due to overlapping genetic markers, mutations, and concealed family relationships. This study reports a unique forensic DNA case from the Kurdistan Region of Iraq, where a national DNA database search revealed multiple paternal candidates. resolving a complex incest case. DNA samples were collected from a child and an alleged father (AF1) accused of sibling incest. Autosomal STR profiling was performed using Identifiler™ Plus and GlobalFiler™ kits. Additional kinship testing was conducted using Y-STR analysis (YFiler™ Plus kit). Local database searching later identified a second potential father (AF2). Mutation analysis and paternity index calculations followed ISFG guidelines. Results indicated AF1 could not be excluded as the biological father despite a TH01 inconsistency, suggesting a mutation. Later, AF2 (a robbery suspect) was also not excluded as a possible father. Kinship testing revealed AF1 and AF2 were brothers. Expanded testing of the wider family conclusively identified AF3, the mother's 15-year-old nephew, as the true biological father. The mother confessed to sexual abuse of her nephew, supporting the DNA findings. This case demonstrates the importance of DNA databases, mutation awareness, and extended kinship analysis in resolving complex incestuous paternity cases and preventing wrongful conclusions.

Keywords

Incest; paternity testing; STR profiling; DNA database; forensic genetics

* Presenting Author

Day 2 - Session 4 (OP 12)

Title

How to Interpret NPS Findings in Hair?

Author/s

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2- Centro Regionale Antidoping, Orbassano (TO), Italy

Abstract

Typical scenarios (passive exposure vs. active consumption, mindful vs. unaware intake, and the meaning of quantitative results, in terms of sporadic vs. chronic use or exposure) have been studied to shed light on possible criteria needed before a definitive interpretation of either positive or negative results can be safely given. Preliminary conclusions can be tentatively outlined, while other factors affecting drug incorporation (e.g. the role of melanin) have not been investigated yet. Nevertheless, updated targeted methods applied on different populations might become effective approaches for NPS/NSO screening to focus on patterns of drug exposure and produce valuable information for prevalence studies. Also, targeting specific markers can be used to delve into the diffusion of compounds (e.g. opioids) which are clandestinely produced or sold. The information obtainable from hair analysis for novel psychoactive substances (NPS) and novel synthetic opioids (NSO), and how to interpret the results, will be discussed in this presentation. In conclusion, when large populations are subjected to NPS/NSO hair analysis, then the gathered results can provide epidemiological data on trends and extent of use in the community and provide useful tools for the results interpretation. Epidemiology studies based on hair analysis (possibly in combination with other sources of information) can increase the knowledge about NPS/NSO use among at-risk populations and produce useful information to inform the policymakers and the national health systems.

Keywords

Hair analysis; NPS; interpretation; passive exposure

* Presenting Author

Day 2 - Session 4 (OP 13)

Title

Short- and Long-Term Stability of Synthetic Cathinones and Dihydro-Metabolites in Human Whole Blood and Urine Samples

Author/s

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Abstract

Synthetic cathinones, have become one of the most prevalent drug classes of new psychoactive substances (NPS) for their psychostimulant and euphoric effects. The concentration of analytes present in biological samples at the time of analysis may significantly differ from the time of sample collection. This is the case for synthetic cathinones as their stability is highly susceptible to degradation and thus, the stability of data of these drugs is crucial. Various factors may influence the stability of synthetic cathinones between sampling and analysis, and therefore, stability studies are required to determine the best storage conditions as well as extend the period of detection. With respect to the latter, it maybe helpful to investigate the potential biomarkers that can prove better stability in biological samples. To date, however, no comprehensive evaluation on the stability of synthetic cathinone metabolites in the biological samples has been published. The purpose of this study was to investigate the stability of a panel of synthetic cathinones and dihydro-metabolites in human whole blood and urine samples under various conditions used in forensic toxicology using a validated liquid chromatography-tandem mass spectrometry method.

Keywords

Synthetic cathinones; dihydro-metabolites; whole blood; urine; new psychoactive substances.

* Presenting Author

Day 2 - Session 4 (OP 14)

Title

Emerging Challenges in New Psychoactive Substance (NPS) Detection and Control in Saudi Arabia

Author/s

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2- Faculty of Medicine, Alfaisal University, Riyadh, Saudi Arabia.

Abstract

New psychoactive substances (NPS) represent a growing global concern due to their rapid evolution, potent toxicity, and limited detection by routine screening methods. While international reports highlight increasing NPS trafficking and fatalities, data from Saudi Arabia remain limited. Recent national findings have confirmed the presence of synthetic cathinones such as mephedrone and N-ethylpentylone, underscoring the need to expand confirmatory testing beyond traditional stimulants. This presentation discusses the evolving NPS threat within Saudi Arabia and ongoing progress in enhancing forensic toxicology capacities, including broader access to LC-MS/MS and HR-MS technologies, the development of unified toxicology databases, and stronger inter-laboratory collaboration. It also highlights the growing impact of newly established postgraduate programs in forensic toxicology that continue to build national expertise and advance research. To strengthen this framework, the presentation recommends establishing a Saudi Early Warning System for Emerging Drugs, enhancing training and certification programs for forensic toxicologists, and creating a Saudi Drug of Abuse Institute as a national center for research, data sharing, and policy development. These initiatives will accelerate identification, improve coordination, and enhance Saudi Arabia's readiness to address emerging NPS challenges.

Keywords

NPS; forensic toxicology; Saudi Arabia; LC-MS/MS; HR-MS

* Presenting Author

Day 2 - Session 4 (OP 15)

Title

Emerging Novel Psychoactive Substances in Seized Materials: Evidence from Southern Saudi Arabia

Author/s

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Abstract

The increasing emergence of Novel Psychoactive Substances (NPS) poses serious analytical and public health challenges across Saudi Arabia, particularly in its southern region, where illicit trafficking routes may facilitate the introduction of new psychoactive compounds. This study focuses on the qualitative detection and structural characterization of NPS in seized materials collected from the southern region of the Kingdom. Identification of Synthetic Cannabinoids, Cathinones, Opioids, and Benzodiazepines circulating in the illicit market was achieved through accurate mass measurement, isotope pattern analysis, and interpretation of fragmentation spectra. And updated spectral information obtained from NMS Labs and the Centre for Forensic Science Research and Education (CFSRE) was used for identification purposes. This approach enabled the recognition of previously unreported analogues and structural modifications intentionally designed to evade legal control. These findings reflect the evolving nature of the regional NPS market and highlight the necessity of maintaining rapid analytical adaptability. This study underscores the importance of integrating HR-MS and GC-MS workflows, regularly updating spectral libraries with international reference data, and promoting inter-laboratory cooperation across Saudi forensic institutions. Strengthening forensic networks and early-warning systems is essential to improve detection efficiency and mitigate the emerging risks associated with NPS circulation in the Southern Saudi Arabia.

Keywords

NPS; seized materials; HR-MS; NMS Labs; CFSRE

* Presenting Author

Day 2 - Session 5 (OP 16)

Title

DFIR 2.0: Reinventing Digital Forensics in the Era of Multi-Agentic AI Systems

Author/s

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Affiliation

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Abstract

The emergence of Multi-Agentic Artificial Intelligence (MAI) is transforming the future of Digital Forensics and Incident Response (DFIR). DFIR 2.0 introduces an intelligent ecosystem where autonomous agents collaborate seamlessly with human analysts across the forensic continuum—evidence acquisition, correlation, attribution, and reporting. Built upon the Model Context Protocol (MCP), the framework enables secure Agent-to-Agent (A2A) coordination, context sharing, and governed tool invocation while maintaining strict ethical, safety, and compliance boundaries. It embeds explainability, auditability, and accountability at the protocol layer, ensuring forensic transparency and legal admissibility. The presentation will showcase the design of a Multi-Agentic AI-driven Security Operations Center (MAI-SoC) that enables a full DFIR ecosystem—integrating traditional forensic tools, AI models, and autonomous agents through MCP-based orchestration. This paradigm redefines DFIR as an autonomous, secure, and ethically compliant investigative fabric, positioning it as the cornerstone of next-generation cyber defense and digital evidence management.

Keywords

Agentic AI, Digital Forensics, Incident Response, cyber defense

* Presenting Author

Day 2 - Session 5 (OP 17)

Title

Deep Learning-Based Forensic Detection of Suspicious Activities in CCTV Systems

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Affiliation

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3- Threat Defense, Sydney, Australia.
4 - Center for Cybercrimes and Economic Crimes, Naif Arab University for Security Sciences, Riyadh, Saudi Arabia.

Abstract

This research study presents a deep learning-based forensic framework for detecting suspicious human activities in CCTV footage without external sensors. The model integrates EfficientNet-B5 for spatial feature extraction and a Vision Transformer (ViT) to capture spatial-temporal dependencies between video frames. Using the Binary UCF-Crime dataset with “Normal” and “Abnormal” classes, data augmentation and weighted loss adjustments mitigate class imbalance. The framework is evaluated using accuracy, precision, F1-score, and AUC, averaged across 5-fold cross-validation. Results show that the ViT-enhanced model achieves 87.23% accuracy, surpassing the EfficientNet-B5 baseline. Ethical and privacy considerations are addressed through anonymization and local edge-based processing to prevent raw data exposure. Overall, the proposed system demonstrates that AI-driven forensic surveillance can effectively identify abnormal activities while ensuring responsible and privacy-aware deployment.

Keywords

Deep Learning, CCTV Surveillance, Vision Transformer, EfficientNet-B5, Privacy.

* Presenting Author

Day 2 - Session 5 (OP 18)

Title

Beyond the Hash Value: An AI-Powered Triage Framework in the Fight Against Child Exploitation

Author/s

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Honorary Associate Professor, School of Computing, Macquarie University, Sydney, Australia

Abstract

The escalating volume of digital evidence in cases of online child exploitation represents a paramount challenge for law enforcement and forensic units globally. Conventional Digital Forensics, dependent on reactive techniques like hash-value matching, are insufficient to address the flood of new and unique material, leading to critical investigative delays. This research paper introduces a transformative, AI-powered triage framework designed to address this bottleneck. Our cross-disciplinary approach leverages Machine Learning, specifically Convolutional Neural Networks (CNNs) for image analysis and Natural Language Processing (NLP) for metadata examination, to move beyond mere file identification. The system enables rapid prioritization of critical cases, intelligent clustering of related digital evidence, and the proactive discovery of previously unknown exploitative content. Rigorous testing on operational datasets demonstrates the framework's high accuracy in flagging novel material, which can reduce the manual screening burden on investigators. This technology is a force-multiplier, enabling a shift from a reactive to a proactive stance in Digital Forensics. By accelerating the analysis of digital evidence, this innovation directly supports faster intervention, enhances victim identification, and strengthens the entire justice process, embodying the conference's vision of leveraging innovative forensic science for a more secure world.

Keywords

AI-Powered Investigation; Digital Forensics Triage; Machine Learning; Child Exploitation; Proactive Digital Forensics.

* Presenting Author

Day 2 - Session 5 (OP 19)

Title

AI-Driven Forensics Framework for Reliable Detection of Ransomware

Author/s

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Abstract

Ransomware continues to pose a critical cybersecurity threat, with attacks such as WannaCry highlighting the necessity for adaptive and intelligent detection approaches. This study introduces DeepRansom, an advanced deep learning framework developed to accurately and transparently identify WannaCry ransomware within complex malware ecosystems. The framework integrates TabNet's feature selection capabilities with the FT-Transformer's contextual representation learning, forming a dual-model structure that supports both performance and interpretability. DeepRansom was trained and tested on a comprehensive dataset of 21,752 samples across 26 malware families, encompassing 11 major ransomware variants. The proposed model reframes WannaCry identification as a binary classification problem and achieves superior outcomes compared to traditional algorithms such as Random Forest, SVM, and XGBoost, as well as other deep learning baselines. Experimental results demonstrate an accuracy of 99.82%, precision of 97.89%, recall of 93.94%, and an AUC of 0.99, alongside robust generalization and minimal false positives. Moreover, interpretability analysis using SHAP values confirms that DeepRansom's predictions rely on relevant behavioral and structural indicators, reinforcing its potential for deployment in real-world network forensics and threat intelligence operations.

Keywords

Network Forensics, Cybersecurity, Deep Learning, FT-Transformer, WannaCry Ransomware.

* Presenting Author

Day 2 - Session 6 (OP 20)

Title

Forensic DNA Phenotyping: From Routine Casework and Historical Cases to Single-Cell Analysis

Author/s

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Abstract

Forensic DNA phenotyping (FDP) infers externally visible characteristics - such as eye, hair and skin colour - biogeographical ancestry and, in some implementations, age estimates from genetic markers, typically using targeted panels analysed by Massively Parallel Sequencing. This presentation outlines integration of FDP into routine casework to generate intelligence when STR profiling yields no match or only partial results, including triage of investigative lines, prioritisation of persons of interest, disaster victim identification, and the re-assessment of cold cases. The talk examines emerging interfaces between FDP and single-cell sequencing, showing how isolating and sequencing individual cells from complex or trace mixtures can deconvolute contributors and enable phenotype/ancestry inference for otherwise masked minor profiles. Finally, applications to archaeological and historical investigations are highlighted, where authenticated ancient DNA permits cautious reconstruction of appearance- and ancestry-related traits to refine hypotheses on provenance, mobility and kinship. Examples illustrate how phenotypic and ancestry inferences, interpreted alongside osteology, isotopes and archaeological context, can add value without overclaiming. Collectively, these developments position FDP as a maturing intelligence tool at the interface of forensic science and heritage studies - powerful when validated, transparently reported and ethically governed.

Keywords

Forensic DNA Phenotyping; Biogeographical ancestry; Massive Parallel Sequencing

* Presenting Author

Day 2 - Session 6 (OP 21)

Title

De Novo Reconstruction of 3D Human Facial Images From DNA Sequence

Author/s

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Abstract

Facial morphology offers invaluable insights into personal identity, especially in forensic science. In the context of high-throughput sequencing, the reconstruction of 3D human facial images from DNA is becoming a revolutionary approach for identifying individuals from unknown biological specimens. Inspired by artificial intelligence techniques in text-to-image synthesis, we propose Difface, a multi-modality model designed to reconstruct 3D facial images only from DNA. Specifically, Difface first utilizes a transformer and a spiral convolution network to map high-dimensional Single Nucleotide Polymorphisms and 3D facial images to the same low-dimensional features, respectively, while establishing the association between both modalities in the latent features in a contrastive manner; and then incorporates a diffusion model to reconstruct facial structures from the characteristics of SNPs. Applying Difface to the Han Chinese database with 9,674 paired SNP phenotypes and 3D facial images demonstrates excellent performance in DNA-to-3D image alignment and reconstruction. Also, including phenotype information in Difface further improves the quality of 3D reconstruction, i.e. Difface can generate 3D facial images of individuals solely from their DNA data, projecting their appearance at various future ages. This work represents pioneer research in de novo generating human facial images from individual genomics information.

Keywords

Facial morphology; 3D Image; Difface; DNA sequence, Han chinese

* Presenting Author

Day 2 - Session 6 (OP 22)

Title

Does Ethnicity Influence DNA Transfer Efficiency?

Author/s

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Abstract

The transfer of cellular material from one surface or individual to another through everyday human contact can have serious implications in forensic reporting. We investigated variation in DNA transfer quantities among four different ethnicities. 16 female volunteers were recruited from among the following four ethnicities: African, South Asian, Levantine and Arabian Gulf. Participants were asked to wash their hands with standardized soap for one minute and resumed daily activities for one hour, then asked to handle a knife for one minute. 88 DNA samples were collected and extracted using Chelex-100, followed by quantification (Quantifiler TrioTM system), amplification (GlobalFilerTM IQC PCR kit), sequenced using the SeqStudio®, and analyzed using the Gene Mapper® ID-X. Analysis of variance revealed significant differences in DNA transfer quantities among the different ethnic groups ($p = 0.0002$) with Levantines having the highest (mean = 0.036ng/ul) and South Asian having the lowest DNA transfer quantities (mean = 0.0038ng/ul). Variation between individuals from the same ethnic group showed no significant difference. Our findings suggest that ethnicity plays a role in DNA transfer, but more critically, this transferred DNA could constitute the major component in a mixed profile, leading to serious implications in forensic reporting and the process of due justice.

Keywords

Ethnicity, DNA transfer, DNA quantity, STR profiles

* Presenting Author

Day 2 - Session 7 (OP 23)

Title

Why Some People "Green Out"? The Analysis of Unregulated "Hemp-derived" Cannabis Products in the United States

Author/s

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Affiliation

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Abstract

The rapid proliferation of high-concentration and semi-synthetic cannabinoid products, stemming from the 2018 US Agricultural Improvement Act and subsequent CBD overproduction, has led to significant public health concerns due to unknown potency and mislabeling. These "legal" and "hemp-derived" tetrahydrocannabinol analogs cause unexpected adverse events, highlighting a critical knowledge gap and the need for robust quality assurance. To address this, a liquid chromatography-tandem mass spectrometry (LC-MS/MS) method was developed and validated for separating and quantifying 32 phytocannabinoids and semi-synthetic cannabinoids, including isobaric compounds and acetate esters, in e-liquids and edibles. Products for analysis were obtained through surveillance, consumer reports of adverse events, or confiscation. The method successfully identified cannabinoid discrepancies: over 75% of products were mislabeled or unlabeled, and accurately identified concentrations often varied by more than ±20% from labels. These findings underscore the urgent need for comprehensive testing methods and stronger regulatory measures to protect consumers amid evolving cannabis markets and increasing adverse event reports.

Keywords

Semi-synthetic cannabinoid products; hemp; phytocannabinoids; legal

* Presenting Author

Day 2 - Session 7 (OP 24)

Title

Unmasking the Cause of Death: The Critical Role of Sample Zero in Forensic Toxicology

Author/s

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Affiliation

General Department of Forensic Science and Criminology, Dubai Police GHQ, United Arab Emirates

Abstract

In forensic toxicology, the interpretation of acute intoxication cases often depends on the availability of the first biological sample collected at hospital admission—known as "Sample Zero." This sample is of paramount importance in revealing the true toxicological profile. Unfortunately, in several real cases, Sample Zero was either discarded or overlooked, with only post-treatment samples retained. Such practices may mask the toxicological cause of death, particularly when resuscitation, detoxification measures, or intravenous fluids alter or eliminate detectable substances. The consequences become more critical when life-saving efforts fail, and the deceased is transferred for forensic investigation. By this stage, the body has often been clinically "washed clean," leaving no toxicological traces of poisons, narcotics, alcohol, or medications. In these situations, the absence of Sample Zero creates significant challenges in determining the true cause of death. This presentation will highlight real-time forensic case studies from Dubai Police in which Sample Zero proved decisive in solving complex criminal cases. It will also review international best practices, highlighting a 2021 Journal of Korean Medical Science study showing that systematic toxicological analysis at emergency admission improved poisoning diagnosis accuracy.

Keywords

Sample zero; forensic; acute intoxication; systematic toxicological analysis; cause of death

* Presenting Author

Day 2 - Session 7 (OP 25)

Title

Qualitative Analysis for Synthetic Cannabinoids in Randomly Collected Urine Specimens and Seized Samples

Author/s

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Affiliation

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Abstract

Synthetic cannabinoids (SCs) are among the most widely encountered new psychoactive substances (NPS. Despite their global proliferation, there is limited literature detailing their forensic detection and characterization in the Gulf region, particularly the United Arab Emirates (UAE). This study aimed to investigate the evolution and structural diversity of SCRAs in seized materials and biological samples in the UAE A comprehensive historical and structural classification of SCs was conducted, followed by the analysis of 28 seized samples and 74 urine samples from forensic cases in Dubai. Seized materials were screened using GC-MS. Urine samples were analyzed using LC-HRAM-MS (Orbitrap) following a solid-phase extraction (SPE) method. Seized samples revealed the presence of 5F-MDMB-PICA, MDMB-4en-PINACA, ADB-BUTINACA, and 4F-ABUTINACA. Metabolites such as MDMB-4en-PINACA M1/M2 and ADB-BUTINACA M1/M2 were detected in urine samples using SPE-LC-HRAM-MS. Developed methodologies and analytical findings offer valuable insights for toxicologists, forensic scientists, and policymakers dealing with the rapidly evolving NPS landscape in the Middle East.

Keywords

Synthetic cannabinoids; SCs; LC-HRAM-MS; GC-MS; UAE; forensic toxicology

* Presenting Author

Day 2 - Session 8 (OP 26)

Title

Developing a Curriculum for Training on Radiological Sources Security for African Universities and Industries

Author/s

Mostafa Kofi*

Affiliation

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Abstract

Education and training in nuclear security are mandatory for capacity building and human resource development. These are key elements for workplaces using nuclear and radiation sources. The presence of qualified and prepared nuclear security staff can minimize risks of theft, intrusion, vandalism, or even the presence of nuclear or radiological sources in unlawful hands. Raising the awareness of nuclear security is the key issue to expanding the culture of nuclear security, which will play a major role in reducing the possibility and risk of unlawful use, loss of, or theft of nuclear or radiological sources. This curriculum aims to raise awareness of nuclear security and expand the culture of nuclear security among all multidisciplinary professionals who have dealt with nuclear or radiological sources during their life cycle or after they become radiological waste.

Keywords

Forensic education, nuclear security, qualified staff.

* Presenting Author

Day 2 - Session 8 (OP 27)

Title

Regulatory Challenges to Investigating AI-Driven Cybercrimes

Author/s

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Abstract

The rapid advancement of Artificial Intelligence (AI) has transformed digital landscapes but has also introduced complex forms of cybercrime. AI-driven attacks are increasingly autonomous, adaptive, and difficult to detect or attribute. This study analyzes the regulatory and procedural challenges in investigating and prosecuting AI-related cybercrimes. Existing legal frameworks remain inadequate, as they often lack clear definitions of AI tools used in crimes, fail to assign liability for actions of autonomous systems, and provide inconsistent rules for handling AI-generated or manipulated evidence. Using a doctrinal legal method combined with comparative legal analysis and qualitative document review, this research applies the CRAAP Test (Currency, Relevance, Authority, Accuracy, and Purpose) to evaluate the credibility and ethical transparency of the sources. Findings reveal persistent legal ambiguities regarding AI tool classification, accountability, and evidentiary authenticity. Real-world disputes, such as ongoing U.S. copyright lawsuits involving OpenAI, Microsoft, and The New York Times, underscore the urgency of legal reform. The study concludes that cohesive international frameworks and adaptive legislative measures are essential for managing the evolving intersection of AI and cybercrime.

Keywords

AI Cybercrime; digital evidence; cyber law; liability; regulation

* Presenting Author

Day 2 - Session 8 (OP 28)

Title

Forensic Document Examination in Criminal Justice: Scientific Tools, Courtroom Admissibility and Challenges- A Case Study

Author/s

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Affiliation

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Abstract

Forensic document examination is a specialized field that authenticates disputed documents using UV/IR imaging, ESDA, and high-resolution microscopy. These techniques are essential for detecting forgery and tampering, yet forensic document examination remains undervalued in Pakistan's legal system. This study assessed the forensic, technological, and legal aspects of document analysis in Khyber Pakhtunkhwa, focusing on chain of custody and examination procedures. Using qualitative interviews with five forensic examiners, fifteen prosecutors, and five defense counsels, the study employed census sampling for experts and purposive sampling for legal professionals with relevant case experience. Key themes included chain of custody, forensic procedures, technological gaps, evidentiary challenges, legal perspectives, and institutional limitations. Frequently disputed documents were stamp papers, cheques, degrees, Nikah Namas, burnt records, mutation files, and writings on walls, leaves, and skin. Ink differentiation, indented writing detection, and signature verification are currently performed using VSC 6000/HS and ESDA-2, but more advanced tools like VSC 8000/HS, 9000/HS, and Leica microscopes are needed for optimal results. Courts treat forensic reports as supporting evidence rather than primary proof. Major challenges include reporting delays, poor coordination, and inadequate expert training. The study calls for scientific upgrades, policy reforms, and institutional collaboration to strengthen the evidentiary role of forensic document examination in Pakistan.

Keywords

Questioned documents; VSC 9000/HS; forensic report; forgery detection; criminal justice

* Presenting Author

Day 2 - Session 8 (OP 29)

Title

The State of Forensic Science in Palestine: Infrastructure, Education, and Legal Frameworks

Author/s

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Abstract

Forensic science plays a vital role in criminal justice by identifying perpetrators and exonerating suspects. This study explores the current state of forensic science in Palestine, focusing on crime scene investigations (CSI), forensic laboratories, expert personnel, and the legal-administrative framework. It also examines education and research in this emerging field. The author reviewed relevant studies, legislation, and conducted interviews with forensic professionals. Forensic science has gained prominence in Palestine over the past decade, especially after the restoration of forensic laboratories under the Palestinian Police Agency (PPA) in 2016. Legislative developments and the introduction of bachelor's and master's programs in forensic science have supported this growth. Scholarly publications have increased, reflecting academic interest. Despite progress, challenges remain in expanding infrastructure, training personnel, and acquiring advanced technology. This article highlights the current landscape, ongoing efforts, and future needs for strengthening forensic science in Palestine.

Keywords

Crime Scene Investigation; DNA profiling; forensic science; laboratories

* Presenting Author

Day 2 - Session 9 (OP 30)

Title

Cybersecurity for Smart Mobility: Challenges and Research Frontiers

Author/s

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Abstract

The rapid evolution of Connected and Autonomous Vehicles (CAVs) presents both unprecedented opportunities and significant cybersecurity challenges. CAVs integrate diverse smart technologies such as sensors, LiDAR, cameras, and Electronic Control Units (ECUs), all interconnected through highly complex networks. As these vehicles become integral to modern transportation systems, their increased connectivity amplifies the surface area for potential cyberattacks, ranging from data breaches to critical system manipulations. This speech will explore the state-of-the-art in cybersecurity for CAVs, addressing key vulnerabilities, attack vectors, and evolving threats in the context of modern automotive ecosystems. We will examine the latest advancements in securing communication protocols, ensuring system integrity, and safeguarding user privacy. Additionally, the speech will highlight emerging trends, challenges, and outline critical research directions that will shape the future of automotive cybersecurity, with a focus on proactive measures and innovative solutions to ensure the safety and trustworthiness of autonomous mobility systems.

Keywords

Cybersecurity, Autonomous Vehicles, Smart Mobility, Automotive Security, Privacy

* Presenting Author

Day 2 - Session 9 (OP 31)

Title

Balancing Technology Innovation and Ethics: Navigating the Ethical Impacts of AI Advancements

Author/s

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Abstract

This presentation explores the critical challenge of balancing fast technological innovations with responsible and ethical consideration in artificial intelligence (A). As AI systems continue to grow and integrate into our day-to-day life, their ethical and social impacts expand in a way that are both deeply complex and transformative. The talk examines how rapid technological breakthroughs intersect with issues of fairness, accountability, privacy, and inclusivity, highlighting the risks of ethical and societal consequences of algorithmic bias, privacy and fairness. Key themes in the talk will include the tension between the speed of AI development and responsible deployment in our decision making, and the need for transparency and accountability of AI systems. Drawing on real-world examples, it underscores the importance of transparency, interdisciplinary collaboration, and global dialogue in shaping AI systems that serve humanity rather than undermine it. By addressing both opportunities and risks, the keynote provides a roadmap for fostering trust in AI while ensuring equitable access to its benefits. Finally, the keynote urges a share responsibility and collective commitment from technologists and decision makers to innovation guided by ethics, where technological progress is not pursued in isolation, but aligned with broader goal of human flourishing.

Keywords

Ethics; AI; interdisciplinary; privacy; inclusivity

* Presenting Author

Day 2 - Session 9 (OP 32)

Title

Hybrid Decision-Fuzzy Reasoning for Financial Fraud Detection in Fintech Forensics

Author/s

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Abstract

In the rapidly evolving landscape of FinTech forensics, the detection and prevention of financial fraud has become a critical area of focus. As digital financial ecosystems expand, so too do the opportunities for sophisticated fraudulent activities, posing serious threats to financial institutions and their clients. Effective fraud detection is now a cornerstone of forensic analysis in modern financial systems. However, traditional detection models often suffer from several limitations, including imbalanced datasets, high false-positive rates, low adaptability to novel fraud strategies, and poor interpretability, which hinder their practical deployment in forensic investigations. To address these challenges, we introduce a novel multi-layered fraud detection framework tailored for FinTech forensic applications. The proposed approach integrates a Decision Tree (DT) classifier with a Fuzzy Inference System (FIS), aiming to improve both detection accuracy and system interpretability. The first layer utilizes a DT model trained on financial transaction data that has been preprocessed using the Synthetic Minority Over-sampling Technique (SMOTE) and Min-Max normalization, effectively addressing data imbalance and enabling crisp rule generation. These decision rules are then translated into fuzzy rules for use in the second layer—the FIS—which introduces a degree of flexibility by evaluating transactions under uncertainty.

Keywords

FinTech Forensics; Financial Fraud Detection; Fuzzy Inference System (FIS).

* Presenting Author

Day 2 - Session 9 (OP 33)

Title

Secure Edge Intelligence for Forensic IoT Devices through TinyFL-Chain with Federated TinyML and Blockchain

Author/s

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Affiliation

1- College of Engineering & Advanced Computing, Alfaisal University, Riyadh, Saudi Arabia

1- Prince Sultan University, College of Computer and Information Science, Riyadh, Saudi Arabia

Abstract

The rapid integration of IoT and embedded sensors into forensic science has revolutionized the collection, analysis, and preservation of digital evidence. As these devices increasingly generate sensitive, high-value data at the crime scene or in mobile forensic units, ensuring the confidentiality, integrity, and validity of both the data and the analytical models becomes essential for maintaining a trustworthy chain of custody. Modern forensic workflows require real-time intelligence motivating a shift toward Tiny Machine Learning (TinyML) deployed directly at the edge. This work introduces TinyFL-Chain, a secure and lightweight edge-AI framework designed specifically for forensic IoT contexts. The architecture integrates federated learning to keep raw forensic data, reducing the risk of exposure or manipulation. To safeguard the evidentiary value of analytical models, a blockchain layer authenticates and immutably records model updates, preventing tampering and ensuring full traceability. Communication across distributed forensic sensors is optimized using the lightweight MQTT protocol, enabling deployment in field conditions where bandwidth, power, and compute resources are limited. The proposed framework provides a robust foundation for modern IoT-enabled forensic ecosystems.

Keywords

Forensic IoT Devices, Digital Evidence Integrity, Federated TinyML, Blockchain Authentication

* Presenting Author

Day 2 - Session 10 (OP 34)

Title

Medical Liability Law in Jordan and Beyond: A Forensic View

Author/s

Majed Alshamaileh*

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National Institute of Forensic Medicine, Jordan

Abstract

Medical liability law helps define how responsibility is shared in healthcare, especially when outcomes don't go as expected. In Jordan, recent legal developments have aimed to clarify what qualifies as medical error and how such cases should be assessed, often through formal review by expert medical committees. Across the Arab region, similar legal approaches are in place, shaped by a combination of professional standards, legal structures, and broader social and ethical values. Forensic medicine plays a central role in this process, offering objective, evidence-based evaluations that help guide legal decisions. These systems reflect a broader effort to connect legal clarity with medical understanding—supporting patient rights while also respecting the realities and responsibilities of medical practice. The presentation will highlight these issues from a forensic perspective in Jordan and the region.

Keywords

Medical liability law; medical error; forensic medicine

* Presenting Author

Day 2 - Session 10 (OP 35)

Title

Age Estimation From Ossification of the Medial Clavicular Epiphysis by Computed Tomography

Author/s

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Abstract

The current study intended to evaluate the accuracy of age estimation from the development of the medial clavicular epiphysis (sternal end of the clavicle) in Egyptian population using computed tomography (CT) and to develop a discriminant formula that can be used in Egyptians. The study was conducted on 142 subjects (84 males and 58 females) after obtaining informed consent. They underwent multi-slice CT scanning of the medial ends of both clavicles. The results revealed that the age of non - union was seen at 8-17 years; incomplete union at 15-20 years and complete union was seen at 20 years. It is concluded that the ossification of medial clavicular end could be used for age estimation. Also, CT is a good visualization tool to be used. Regression analysis for each and both clavicles in both sexes is specific to Egyptian population and should be used after validation of the results in other ones. The study recommended using stage 1 to be <17 years; stage 2 to be >15 years; Stage 3 to be >15 years; stage 4 of maturation to be >19 years and stage 5 to be >21 years.

Keywords

Age estimation; ossification status; medial clavicular epiphysis; sternal end of the clavicle; computed tomography

* Presenting Author

Day 2 - Session 10 (OP 36)

العنوان

الجوانب الطبية الشرعية لإساءة معاملة الأطفال: دراسة استطلاعية لـ 159 حالة تم التعامل معها في قسم الطب الشرعي ببني مسوس في الجزائر العاصمة

المؤلفون

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الملخص

إساءة معاملة الأطفال هي أي شكل من أشكال العنف أو الإساءة أو الإهمال الذي يرتكبه البالغون ضد القُصّر، مع ما يترتب على ذلك من تداعيات خطيرة على صحة الطفل البدنية والعقلية تعد إساءة معاملة الأطفال مشكلة اجتماعية كبيرة في مجتمعنا. الهدف الرئيسي من دراستنا هو وضع لمحة طبية قانونية عن الأطفال ضحايا سوء المعاملة الذين عولجوا في وحدة التحقيق الطبي القانوني بمصلحة الطب الشرعي بمستشفى بني مسوس الجامعي اخترنا الحديث عن هذه المشكلة من أجل زيادة الوعي بهذا الواقع بين عامة الناس، وقبل كل شيء بين العاملين في مجال الرعاية الصحية، لجعلها ملموسة وإخراجها من خصوصية المنازل خلال فترة الدراسة، قمنا برعاية 159 طفلًا من الأطفال ضحايا جميع أنواع الإساءة. كانت هذه دراسة وصفية مستعرضة لسلسلة من الحالات مع جمع معلومات مستقبلية عن جميع حالات إساءة معاملة الأطفال المفترضة، أجريت على مدار الفترة من 1 مارس 2019 إلى 30 نوفمبر 2022، أي 45 شهرًا، يمثل سوء معاملة الأطفال حوالي 32.9% من استشارات الأطفال في قسمنا و9.4% من استشارات الأم والطفل. وقد تأثرت جميع الفئات العمرية، مع غلبة الذكور في السكان الذين شملتهم الدراسة. كان متوسط عمر بداية الاعتداء المتكرر لدى الضحايا لدينا بين 1 و15 سنة. ولوحظ أيضًا أن أكثر من نصف حالات الإساءة حدثت في منزل الأسرة وأن أنواع الإساءة المختلفة كانت مرتبطة في غالبية الحالات. وُجد أن جميع الضحايا تقريبًا يعانون من واحد أو أكثر من الاضطرابات النفسية متعددة الأشكال. وتلقى غالبية الضحايا المشورة والمتابعة النفسية. إن إساءة معاملة الأطفال شائعة ولكنها لا تزال غير مقدرة حق قدرها ولا تحظى بالتقدير الكافي. إنها ظاهرة معقدة ومتنوعة وذات معدل تغير مرتفع. وينتج عن تفاعل مجموعة من العوامل الفردية والبيئية والاجتماعية. العلاج النفسي منهجي ويهدف إلى تقصير أو تقليل التداعيات النفسية التي يعاني منها الطفل

الكلمات المفتاحية

إساءة معاملة الأطفال، ظاهرة معقدة، مشكلة صحية عامة، نقص التقييم، التداعيات النفسية

* Presenting Author

Day 2 - Session 10 (OP 37)

Title

Characteristics of Homicidal Cut-throat Injuries

Author/s

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3- School of Medicine, University of Jordan, Amman, Jordan

Abstract

Homicidal cut-throat injuries represent a significant challenge in forensic pathology, especially in terms of accurately determining the manner of death. This study aims to identify key findings that can assist in determining the origin of homicidal intent based on crime scene investigations, the number of wounds, and their characteristics. We conducted a retrospective analysis of 20 cases of homicidal cut-throat injuries in Amman that took place between 2009 and 2022. Both males and females were involved, with 11 of the 20 victims being male. These cases were handled by the forensic department at Jordan University Hospital and the National Institute of Forensic Medicine in Northern Amman. The fatal neck wounds were classified by depth into three grades and by location into three levels (upper, middle, lower). The relationships between the level and grade of neck wounds, superficial neck wounds, and other body injuries revealed several patterns distinguishing homicidal cut-throat injuries. This study enhances understanding of the patterns and characteristics associated with homicidal cut-throat injuries, providing valuable insights for forensic investigations. Findings revealed that even in homicidal cutthroat cases, superficial incisions parallel to the primary deep neck incision were common. Therefore, we emphasize avoiding diagnosing these superficial incisions as hesitation marks.

Keywords

Suicidal cut-throat; homicidal cut-throat; wounds; forensic medicine

* Presenting Author

Day 2 - Session 11 (OP 38)

Title

Means, Opportunity, and Motive: The Timeless Trifecta of the Bomber

Author/s

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Abstract

Since the invention of explosives, these tools which spawned the industrial revolution have found utility by those intent to do society harm. The societal conditions that emerge time and again which draw people to destructive use of explosives will be discussed. Historical examples of how motivations have changed yet maintained consistent foundations will be presented. While motivation has remained steady over the centuries, bombers have been able to subvert technology as it has developed to evolve their IEDs. The evolution of terrorist explosives will be contrasted against the backdrop of motivational consistency.

Keywords

Explosives; IEDs; bomber

Day 2 - Session 11 (OP 39)

Title

Quantitative Measurement of Toolmark on Bone

Author/s

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Affiliation

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Abstract

This study explores the quantitative analysis of toolmarks on bone to address the subjectivity in forensic comparisons (1) (2). It hypothesizes that standardized methods can enhance evaluations of toolmarks on human tissue. At the time of writing, no international standard exists for maceration and degreasing that optimizes toolmark casting for forensic purposes (3). The research employs a structured methodology, including the creation of toolmarks on juvenile pig femurs using a Draper-Redline cold steel chisel, followed by various maceration and degreasing processes. Microscopic intra- and inter-observer assessments were conducted to evaluate toolmark preservation, and 3D scanning with MATLAB-based cross-correlation function (CCF) analysis was used to measure toolmark similarity before and after maceration. This approach utilizes both light and virtual comparison microscopy (LCM - VCM) in achieving the aim (4). Results indicate that maceration degrades toolmark integrity across all methods. Warm water (55-70°C) and enzyme-based treatments (25-40°C) were fastest, completing in two hours, while cold water took up to six days. Acetone is preferred over triple-cast degreasing for its cost-effectiveness and efficiency. Toolmarks on bone should be documented prior to maceration to avoid degradation. The study highlights the need for standardized forensic protocols and lays groundwork for improving toolmark recovery techniques.

Keywords

Bone, homicide, maceration, survey, toolmark

* Presenting Author

Day 2 - Session 11 (OP 40)

Title

Gelatin-Based Hydrogels as a Novel Medium for the Efficient Recovery of Organic Explosives from Simulated Post-Blast Residues: A Forensic Evaluation.

Author/s

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Abstract

Post-blast residue analysis is critical for forensic investigations, enabling the identification of organic explosives like Trinitrotoluene (TNT), Pentaerythritol tetranitrate (PETN), and 2-Nitrotoluene (2-NT) to reconstruct crime scenes and link perpetrators to illicit activities. Efficient collection of residues from diverse surfaces is essential for accurate forensic analysis and ensuring justice. Traditional methods such as cotton swabbing or solvent washing recover only 50-70% of residues and are prone to contamination, sample loss, and inefficiency on porous or irregular surfaces. A versatile, eco-friendly medium that enhances recovery across varied substrates is urgently needed. This study explores gelatin-based hydrogels (GHs) as an innovative, biocompatible medium for post-blast residue collection, leveraging their unique adsorbent/absorbent properties for improved surface contact and reduced contamination risks. The research evaluates GHs for recovering TNT, PETN, and 2-NT from ten surfaces spiked with explosive solutions to mimic post-blast residues (e.g., metals, plastics, wood, cloth) using Gas Chromatography-Mass Spectrometry (GC-MS) for qualitative identification. Triplicate experiments demonstrated recovery rates of 80–95% (mean ± 5% SD) on non-porous surfaces, validated via ANOVA ($p < 0.05$). GC-MS confirmed distinct m/z peaks for each explosive (TNT: 210, 193, 180; PETN: 240, 194, 149; 2-NT: 137, 120, 91) with limits of detection of 0.1–0.5 µg/mL and signal-to-noise ratios >3:1, indicating high sensitivity. GHs offer a cost-effective, field applicable alternative to traditional methods, significantly improving residue recovery and analytical reliability.

Keywords

Post-blast residue recovery; PETN; 2-NT; gelatin-based hydrogels

* Presenting Author

Day 2 - Session 11 (OP 41)

Title

Techniques for Restoring Fingerprints from Human Remains Exposed to Extreme Heat: Challenges and Modern Approaches

Author/s

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Abstract

Accurate identification of victims and suspects is a crucial element in criminal investigations, particularly in cases where bodies have been exposed to extreme heat that damages or destroys conventional fingerprint evidence. This study explores a novel method for restoring latent fingerprints from heat-exposed corpses using an alcoholic sodium carbonate (Na_2CO_3) solution. The chemical mixture was prepared in the Forensic Evidence Laboratories of Riyadh Police, consisting of 10 g sodium carbonate, 316 ml of 95% ethanol, and 684 ml of distilled water. Experimental trials demonstrated that soaking the affected fingers in this solution for 5 to 72 hours enabled the recovery of recognizable and comparable fingerprint patterns. These restored prints were successfully matched with entries in existing forensic fingerprint databases, confirming the method's reliability. The results indicate that this technique can be a valuable alternative when conventional methods fail due to severe heat exposure, tissue dehydration, or discoloration. The study further recommends adopting this approach across forensic laboratories in Saudi Arabia and providing specialized training for forensic technicians. Integration of this method with DNA and other biometric identification systems can significantly enhance the efficiency and accuracy of human identification in disaster and criminal scenarios.

Keywords

Fingerprint recovery; forensic identification; heat-exposed bodies; sodium carbonate solution; biometric analysis

* Presenting Author

Day 3 - Session 12 (OP 42)

Title

Global Unity in Crisis: INTERPOL's Role in Disaster Victim Identification

Author/s

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Affiliation

INTERPOL,Lyon, France

Abstract

INTERPOL, the world's largest international law enforcement organization, unites 196 member countries to combat transnational crime and enhance global security. A critical yet often overlooked function is its Disaster Victim Identification (DVI) unit, which plays a vital role in responding to mass casualty events — from natural disasters and terrorist attacks to aviation and maritime accidents. The DVI unit serves as a global coordination hub, providing standardized protocols, technical guidance, and real-time support to national forensic teams. It ensures that remains are accurately identified, families receive timely answers, and human dignity is upheld amid chaos. Through its secure communication networks, databases like the DVI Reference Database, and training programs, INTERPOL enables seamless cross-border collaboration even in high-pressure scenarios. The unit also assists in the repatriation of victims and supports legal and humanitarian processes by maintaining chain-of-custody documentation. This presentation explores the DVI unit's operational framework, the integration of advanced forensic technologies, and the ethical imperatives guiding its work. By strengthening international preparedness and response capacity, INTERPOL's DVI efforts not only save lives in the aftermath of tragedy — they restore hope, identity, and justice to grieving communities worldwide.

Keywords

INTERPOL; DVI; reference database; cross border; operational framework

* Presenting Author

Day 3 - Session 12 (OP 43)

Title

Ethical Perspectives and Attitudes of Disaster Management Workers in the Middle East

Author/s

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Affiliation

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Abstract

Disaster responders in the Middle East face high-pressure environments where ethical decision-making is vital to ensure fairness, dignity, and minimize harm. This study explores their ethical attitudes across all disaster management phases: preparedness, response, recovery, and mitigation. Using a quantitative cross-sectional design, data were collected from 86 personnel—including medical staff, rescue teams, and volunteers—via a validated questionnaire. Findings reveal a gap between ethical knowledge and practice. While 82% understood confidentiality, only 67% applied it consistently. Resource allocation and autonomy showed even larger gaps, with just 45% and 35% applying these principles in the field. Cultural norms and local values further complicated ethical decisions, highlighting the need for context-sensitive approaches. Current training programs emphasize operational readiness but neglect ethical preparedness. To address this, ethics should be integrated into disaster training and reinforced through ongoing professional development and structured debriefings. Enhancing ethical competence will better equip responders to handle moral complexities in disaster scenarios.

Keywords

Disaster management; ethics; responder; training

* Presenting Author

Day 3 - Session 12 (OP 44)

Title

Fingerprint-Based Strategies for Mass Disaster Victim Identification

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Abstract

Mass disasters—whether natural or accidental is always challenging for timely and accurate victim identifications. Fingerprint identification is one of the fastest, most accurate and cost-effective forensic tools in Disaster Victim Identification (DVI), especially when deceased cannot be visually recognized or DNA and dental records are not available. This presentation explores fingerprint-based DVI strategies, including field collection techniques, postmortem fingerprint recovery methods, use of Automated Fingerprint Identification Systems (AFIS), interoperability of criminal and civil databases, and challenges associated with decomposed, macerated and desiccated friction ridge skin. Case studies from international disaster responses highlight practical approaches, strengths, limitations, and innovations like skin rehydration, powdering, gloving, live-scan postmortem techniques, and soft inking. The presentation aims to share with the participants a comprehensive understanding of how fingerprints contribute to rapid, scientific and cost-effective victim identifications in mass disaster circumstances.

Keywords

Fingerprint identification; decomposed friction ridge skin; mass disaster; postmortem; AFIS

* Presenting Author

Day 3 - Session 12 (OP 45)

Title

Operation Logan: Identification of Human Remains Discovered After a Major Fire

Author/s

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Abstract

This case study highlights the importance of adhering to the protocols within Dister Victim Identification (DVI). DVI teams are deployed in so called open and closed disasters. Open Disasters: These are disasters that no one knows how many people have died. These often concern natural disasters such as earthquakes, floods, wildfires, but also certain (large) terrorist attacks. Closed disasters: These are disasters where it is very likely that the number of casualties will be immediately established. Often these are disasters where prior registration of the persons concerned has already taken place, such as aircraft accidents (passenger list). Combination open and closed disasters: These are disasters where a combination of the above mentioned disasters occurs. One example of this is an airplane crashing into a residential area. In this case, four victims were discovered in the rubble of a building after a large fire. It was originally classed as an open disaster but correct procedures, as defined by Interpol, were not fully implemented. However, primary identification, which include obtaining fingerprints, odontology and DNA, was successful after the introduction of additional information from another country.

Keywords

Disaster Victim Identification; fingerprints; odontology; DNA

* Presenting Author

Day 3 - Session 13 (OP 46)

Title

Toxicological Findings in 6,051 Drug-Facilitated Crime Casework: Scope, Patterns, and Interpretation

Author/s

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Abstract

Drug-facilitated crimes (DFC) involve the covert administration of substances to impair or incapacitate victims, creating significant challenges for forensic toxicology. This study reviewed 6,051 case submissions applying testing protocols consistent with AAFS Standards Board (ASB) 121 recommendations. Ethanol was the most frequently detected drug, present in about 40% of cases. Cannabinoids, primarily delta-9-tetrahydrocannabinol (THC) and its metabolites, appeared in roughly 30%. Cocaine and its metabolite benzoylecgonine were detected in around 10% of cases, and methamphetamine in 5-6%. Although sedatives predominated, stimulants were commonly identified, often in combination with alcohol or cannabinoids. Substance detection varies by specimen type. Urine generally provides longer detection windows than blood, influencing positivity rates and interpretive value. Age differences were also observed: stimulant positivity was more frequent among adults, while sedating agents were more common in adolescents and children. Sample timing and matrix choice critically affected the likelihood of identifying relevant substances. Gamma-hydroxybutyrate (GHB) was rarely detected at levels consistent with exogenous use, and flunitrazepam appeared in only a single case. The lack of recommendations for designer benzodiazepines in ASB 121 represents an important gap, given their growing role in the drug landscape. These findings underscore the importance of maintaining broad, pharmacologically informed testing strategies in DFC investigations. Restricting panels to sedatives alone risks missing substances or polydrug patterns critical to understanding impairment.

Keywords

Drug facilitated crime; date rape; sexual assault; AAFS

* Presenting Author

Day 3 - Session 13 (OP 47)

Title

Tiny Bodies, Big Mysteries: Interpreting Toxicology in Paediatric Deaths

Author/s

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Abstract

Paediatric postmortem forensic toxicology remains a complex and underexplored field. Children differ fundamentally from adults in anatomy, physiology, and metabolism, rendering toxicological interpretations uniquely challenging. Limitations include reduced or degraded specimen quality and quantity, restricted analytical scope, lack of age-specific reference ranges, developmental variability in absorption, distribution, metabolism and elimination of substances, and confounding medical conditions. This presentation reviews a series of paediatric postmortem cases encompassing a range of ages, exposure scenarios, and toxic agents. Comparative analysis identifies recurrent patterns and areas for procedural and interpretative improvement. Critical variables include age, body weight, developmental stage, dose and route of exposure, timing relative to death, and the presence of comorbidities or therapeutic interventions. Analytical considerations include specimen selection, pre-analytical handling, and potential matrix interferences, as well as method sensitivity, specificity, and susceptibility to false positives or negatives. Paediatric postmortem toxicology poses distinctive scientific and interpretative challenges. The most common pitfalls arise from applying adult reference ranges to paediatric cases, neglecting developmental pharmacokinetics, and failing to consider alternative explanations for detected substances. Continued case-based learning, data sharing, and development of age-specific reference information are vital to advance reliability and consistency in this critical area of forensic toxicology.

Keywords

Forensic Toxicology; paediatric; postmortem; children; poisoning

* Presenting Author

Day 3 - Session 13 (OP 48)

Title

An Innovative Polar Gas Phase Approach for the Analysis of Amphetamines and Cathinones Using GC-MS

Author/s

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Abstract

A direct gas chromatographic (GC) analysis of short-chain amines such as amphetamines and cathinones presents significant challenges due to strong dipole-dipole and hydrogen-bonding interactions with active silanol and siloxane sites in the GC inlet and column. These interactions often lead to catalytic degradation and severe peak tailing. In this study, a Polar Gas Phase Approach (PGPA) was developed to overcome these issues by introducing ammonia or methylamine gases into the carrier gas (helium) to block active sites. Both ammonia and methylamine possess strong dipole moments (1.4 D) and can effectively block active silanol and siloxane sites through hydrogen bonding and dipole-dipole interactions, thereby minimizing analyte adsorption. Optimal results were achieved with 1-10% ammonia or methylamine in helium, producing consistent chromatographic peaks without adversely affecting ionization efficiency in mass spectrometry (MS). Ammonia and methylamine were generated according to our patent (US 12,098,078 B1). Methylamine showed superior performance compared to ammonia. The effect of ammonia and methylamine on other drugs was evaluated by analyzing a mixture of drugs with various chemical functional groups, including morphine, cocaine, THC, diazepam, and caffeine, showing no detrimental effects on peak shape. This method provides a robust and practical solution for improving the GC-MS analysis of primary and secondary amines without derivatization in forensic, pharmaceutical, and industrial applications.

Keywords

Polar Gas Phase; ammonia; GC-MS; amphetamines; cathinones

* Presenting Author

Day 3 - Session 13 (OP 49)

Title

Stability of Ethanol and Common Volatiles in Blood: The Influence of Preservatives, Antioxidants, and Storage Conditions "A retrospective study"

Author/s

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Abstract

This study investigated the stability of ethanol and other volatiles under controlled laboratory and casework storage conditions, with and without preservatives and antioxidants, to support forensic interpretation. To assess the stability of ethanol, methanol, isopropanol, n-propanol, and acetone in spiked blood samples under different storage conditions, and to evaluate ethanol stability in preserved and unpreserved postmortem case samples. Blood was spiked with ethanol, methanol, isopropanol, n-propanol (20 and 80 mg/dL), and acetone (20 and 80 mg/L). Samples were stored at 25 °C, 4 °C, and −22 °C for up to 50 days with sodium fluoride (NaF) preservative and sodium metabisulphite antioxidant and analysed using validated HS-GC-FID method with t-butanol as internal standard. In addition, 219 preserved road traffic case samples were re-analysed after long-term storage of up to 5 years, and 71 paired preserved and unpreserved postmortem blood samples were re-analysed after up to 16 months of storage at refrigerated or frozen conditions. Ethanol stability was strongly dependent on preservation and storage. Methanol remained stable under all conditions tested. Freezer storage preserved all volatiles effectively. Ethanol and volatile stability are highly influenced by temperature, preservatives, and microbial activity. Methanol is consistently stable, whereas acetone, isopropanol, and n-propanol undergo interconversion, complicating interpretation.

Keywords

Ethanol; volatiles; stability; methanol; preservatives

* Presenting Author

Day 3 - Session 14 (OP 50)

Title

Medico-Legal Aspects of Suicidal Bomb Attacks

Author/s

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Abstract

Explosive manufacturing industry has found rapid advancement and available in mass scales to become a weapon of choice in many parts of the world for military, commercial, criminal and organized terror activities due to easiness in handling storage and transportation. Suicidal bomb attacks were first heard during Second World War and at present often occur in the Middle Eastern region, Afghanistan and occasionally in the Western world. Injuries due to high explosive devices are almost unheard in Sri Lanka until early 80s and only accidental explosions associated with industrial situations were seen far in between. With second up rise of Southern rebellion during the insurgency period from 1983 to 1989, and also due to three decade long civil war in the Northern part of the country, bomb explosions became one of the frequent entities of our day-to-day life. Mass fatalities due to suicidal bomb attacks were often heard in Sri Lanka until end of thirty years old civil war in May 2009, then again during Easter attack in 2019. There had been at least 120 suicidal attacks on civilian targets while majority incidents had taken place in capital city Colombo. The suicidal bomb attack in a form of “a carried bomb” or “a body bomb” became a hallmark of the Srilankan explosive scene.

Keywords

Suicide bomber, mass causality, disaster management

* Presenting Author

Day 3 - Session 14 (OP 51)

Title

An Autopsy Study of Ligature Mark in 634 Cases of Suicidal Hangings

Author/s

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Abstract

Ligature mark analysis is crucial in autopsies of suspension deaths. This study aims to identify characteristic features of ligature marks in suicidal hangings. 634 cases of suicidal hanging were examined, focusing on gender, knot type and position, and ligature mark attributes—site, level, number, continuity, and shape. In partial hangings, 86% had ligature marks across the thyroid cartilage, nearly horizontal in front. In complete hangings, 92% had marks above the thyroid cartilage. Ligature marks were incomplete in 81% of complete and 73% of partial hangings. Marks were limited to the front of the neck in 38% of partial and 13% of complete hangings. Petechial hemorrhages were absent in complete hangings. A slip knot was used in 97.73% of cases, with the knot positioned at the nape of the neck in 78% of cases. The study highlights distinct ligature mark patterns in complete and partial suicidal hangings. The large sample size strengthens the relevance of these findings.

Keywords

Suspension, ligature marks, suicidal hanging, complete and partial hanging, knots.

* Presenting Author

Day 3 - Session 14 (OP 52)

Title

Intrafamilial Homicides in the Region of Laghouat: A 15-Year Medico-Legal Study

Author/s

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Affiliation

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Abstract

Intrafamilial homicide represents a major medico-legal and public health concern yet remains poorly studied in Algeria. This study describes the sociodemographic characteristics of victims and perpetrators, analyzes the methods and motives, and identifies medico-legal specificities observed in Laghouat and its surrounding regions. A descriptive and retrospective study was conducted over 15 years at the Department of Forensic Medicine in Laghouat, which performs autopsies for neighboring provinces. All intrafamilial homicides investigated by medico-legal autopsy upon judicial authorities' requests were included. Data covered victims' and perpetrators' characteristics, crime circumstances, weapons used, motives, and psychiatric history. Thirty-nine cases were recorded, demonstrating 11.7% of all homicides during the study period. Victims were predominantly female (60%), mean age of 27 years (±21.3; range: newborn to 77). Blunt objects (41%) and sharp instruments (31%) were the major weapons. Conjugal homicides mostly involved young women from low socioeconomic backgrounds, while parricides stemmed from financial or familial conflicts. Few perpetrators had documented psychiatric disorders (over 2/3 cases). Intrafamilial homicide in Laghouat and its suburbs primarily affected women in domestic violence. The lack of psychiatric evaluation and limited judicial data hinders understanding of perpetrator profiles. Prevention requires early detection of domestic violence, strengthened socio-legal and medico-legal collaborations.

Keywords

Intrafamilial homicide; forensic medicine; domestic violence; Algeria; autopsy.

* Presenting Author

Day 3 - Session 14 (OP 53)

Title

Forensic Archaeology and Anthropology in ICMP: The Iraq Program

Author/s

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Abstract

Iraq continues to face enormous challenges related to recovering, identifying, and analyzing victims from the numerous prior events that have occurred as a result of multiple wars with neighboring countries and internal violence under the Ba'ath Regime and the occupation by terrorists. Mass grave investigations in Iraq started in 2003 following the American-led invasion. Since this time the Iraqi authorities with the assistance of various international organizations, including the International Commission on Missing Persons (ICMP), have investigated over 320 mass graves, over 250 of those positive for human remains. During this 22-year (2003-2025) period, many processes and protocols, laws, changes in funding, political influence in the task of search and exhumation, ethical dilemmas, and other challenges have been encountered in the application of forensic archaeology and anthropology. This presentation outlines the support ICMP is providing to Iraqi authorities in the fields of forensic archaeology and anthropology highlighting some of the achievements as well as ongoing challenges.

Keywords

Forensic archaeology, Forensic anthropology, Iraq, mass graves

* Presenting Author

Day 3 - Session 15 (OP 54)

Title

Technical Challenges in Undertaking Large-scale Identification Following Disasters and Conflicts

Author/s

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Abstract

Identification of human remains following conflicts and disasters is intrinsically challenging. The logistics of locating and recovering the remains can lead to long periods post-mortem before samples can be taken, often precluding the possibility of collecting soft tissue. Therefore, skeletal remains are often recovered, and DNA-based methods in many cases are the only viable means to establish identities. The need to extract DNA from multiple bone samples is challenging with several steps required that are not typically used in forensic DNA laboratories. Different approaches exist for cleaning and powdering the samples prior to extraction and the extraction process itself can vary widely depending on the degree of degradation and the potential presence of PCR inhibitors in the samples. In this paper we will summarise the findings of different approaches in the context of Malaysia and Iraq, comparing the efficacy of different commercial extraction kits with total demineralisation, partial demineralisation and no demineralisation. In our experience total demineralisation followed by silica-based capture yields the best results. However, simpler methods, that are less resource intensive, can yield adequate DNA in many cases and may be more appropriate in many cases.

Keywords

DVI; post-conflict identification; DNA extraction; total demineralisation; partial demineralisation.

* Presenting Author

Day 3 - Session 15 (OP 55)

Title

ICMP DNA Laboratories: Supporting Missing Persons Investigations

Author/s

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International Commission of Missing Persons (ICMP), Hague; Netherlands

Abstract

This presentation will provide an overview of ICMP and the work of ICMP's ISO 17025-accredited DNA Laboratories in The Hague, supporting global investigations into missing persons. The scale of the missing persons issue and the different causes of persons going missing are highlighted, including conflict, migration, and mass disasters. Some key components of resolving large-scale missing persons contexts will be described such as the involvement of the families of the missing, alongside challenges that are routinely encountered. Developments in technology that support the resolution of a greater number of identifications will be discussed, such as ICMP's standing capacity to support Disaster Victim Identification and Next Generation Sequencing.

Keywords

ICMP; DNA laboratories; DVI; missing person

* Presenting Author

Day 3 - Session 15 (OP 56)

Title

Unveiling DNA at Crime Scenes Using Nano-Sensing Technology

Author/s

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Abstract

Forensic DNA profiling is a powerful tool used in criminal investigating to identify suspects and establish connections between crime scenes. However, in cases where experts are unable to detect and identify any biological traces or human-derived cells at the crime scene or while testing the samples in the laboratories, all the advantages offered by forensic laboratories lose their significance. It becomes a waste of time, effort, and resources allocated to these laboratories. Therefore, there is an urgent need for technology that enables crime scene experts to detect latent and concealed human traces before they leave the scene. The talk will introduce a novel qualitative and quantitative approach to tackle the challenges faced by crime scene experts in identifying challenging traces using instant, low-cost, uncomplicated, portable, sensitive detection technology by introducing the Quartz Tuning Fork (QTF)-based biosensor technology as an initial screening technique.

Keywords

Criminal Investigations; trace DNA; recovery; quartz tuning fork; screening; biosensors; crime science.

* Presenting Author

Day 3 - Session 16 (OP 57)

Title

Detection of Etomidate-Class Psychoactives in a Seized Powder: Forensic Confirmation of Anaesthetic-Derived Substances

Author/s

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Abstract

Illicit drug markets are undergoing a marked shift from traditional psychoactive substances and cutting agents toward novel sedatives and anaesthetic-derived compounds. Etomidate-class substances exemplify this trend, with recent detections in seized materials reflecting evolving practices. This study was done to confirm the presence of anaesthetic-derived psychoactive substances in a seized powder sample and situate the finding within current trends in emerging substances. The sample was screened using routine mass spectrometry and confirmed through high-resolution exact-mass verification. Positive identification required concordant fragmentation spectra and retention behaviour. This included both anaesthetic-derived agents and common psychoactive compounds. Etomidate and metomidate were identified as the only psychoactive constituents above reporting thresholds. No controlled drugs from other classes were detected. The concordance of routine and exact-mass spectral data supported confident identification. The profile was consistent with recent reports of anaesthetic-class substances in seized street supplies. The confirmed presence of etomidate-class psychoactives in a seized powder highlights their role as emerging primary constituents in illicit markets. Forensic investigation would benefit from incorporating anaesthetic-derived targets into suspect libraries, applying orthogonal confirmation where available, and contributing reference spectra to strengthen surveillance and early-warning systems.

Keywords

Emerging psychoactives; seized powder; etomidate; metomidate; anaesthetic-derived substances

* Presenting Author

Day 3 - Session 16 (OP 58)

Title

Automated Impurity Profiling of Gas chromatography-Mass Spectrometry Methylamphetamine Data Using R Scripts

Author/s

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Abstract

Forensic analysis of illicit drugs increasingly relies on impurity profiling to provide intelligence on synthetic routes, sources, and links between seizures using GCMS. Obtaining this information from GC-MS data usually involved manual analysis and interpretation which, leads to inconsistencies, potential errors and is resource intensive. This study develops an automated computational approach, implemented in R, to overcome these issues, streamlining impurity detection and profiling in illicit drug samples. Raw GC-MS data of 128 fully characterised methylamphetamine samples were processed using R scripts that applied baseline correction, smoothing, and automated peak detection with a signal-to-noise threshold (SNR ≥ 3). The results generated by the R script were then validated against manually processed datasets. Impurities were mapped using an intensity-based ranking approach to explore variations in impurity intensities and distributions. Across all 128 samples, 23,885 initial peaks were detected, including all peaks (n=1,531) previously identified using a manual approach. The optimal number of top-ranked peaks required to capture reference impurities varied across synthetic routes, reflecting differences in impurity distributions. Peak assignment using mass spectral similarity (angular vector comparison), enabled consistent matching between samples, with values ranging from 0 being an opposite match to 1 being a perfect match to the reference peak.

Keywords

Forensic intelligence; impurity detection; spectral similarity; data processing.

* Presenting Author

Day 3 - Session 16 (OP 59)

Title

Through a New Lens: Diclazepam, a Designer Benzodiazepine, Forensic Profiling Using an Alternative Model.

Author/s

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Abstract

Designer benzodiazepines are a part of the emerging Novel Psychoactive Substances (NPS), which need to be controlled due to their constantly growing market. Most of them may possess stronger effects, more toxicity, and longer durations of action than certified benzodiazepines. This study is aiming to use an in-vivo mice model as an alternative, yet informative, indicator model as an initial step to detect and identify designer drugs such as diclazepam and its metabolites in positive urine samples of mice, their postmortem tissue organ distribution in brain parts, spleen, kidney, heart and liver and study their behavior inside the body. Diclazepam and its metabolites, delorazepam, lorazepam and lormetazepam were successfully identified with a positive response when tested in overdosed positive mice urine samples using EMIT, at 24h and 48h, as a presumptive test and were confirmed by GC-MS mainly at 24h, except for lorazepam which was detected in urine samples of 24h and 48h. The parent drug and its metabolites distribution in various organs were studied using UHPLC analysis. Delorazepam was shown to have the highest distribution in all the analyzed organs being produced majorly by the extensive metabolism of diclazepam in liver which was shown after 2h of drug administration.

Keywords

Diclazepam; GC-MS; EMIT; UHPLC; designer benzodiazepines

* Presenting Author

Day 3 - Session 17 (OP 60)

Title

Classification of Cannabis in Morocco: The Importance of Laboratory Analysis in Distinguishing Legal and Prohibited Uses

Author/s

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Abstract

In Morocco, the issue of THC and CBD dosage holds particular importance in the context of the recent regulated legalization of cannabis use for medical, cosmetic, and industrial purposes. Within this framework, the precise measurement of THC and CBD becomes a crucial requirement for distinguishing between legal uses and recreational use, which remains prohibited by law. Cannabis legislation in Morocco underwent a major transformation with the adoption of Law 13-21 in March 2021, which authorized the use of cannabis for medical, cosmetic, and industrial purposes, while maintaining its prohibition for recreational use. The country also established the National Agency for the Regulation of Activities Related to Cannabis (ANRAC), which is responsible for issuing licenses, overseeing cultivation in designated areas, and ensuring compliance with health, environmental, and technical standards. A decree published in May 2025 further strengthened this regulatory framework by setting specific requirements for authorized agricultural cooperatives. Through precise analysis of THC and CBD concentrations, the laboratory determines the intended final use of the product—whether festive (prohibited), medical, or cosmetic (authorized and regulated). The laboratory enables the classification of cannabis-derived products based on their chemical profile, verifies their compliance with legal standards, and helps prevent any risk of diversion toward illicit use.

Keywords

Cannabis ; THC ; CBD ; psychoactive substance ; non-psychoactive substance

* Presenting Author

Day 3 - Session 17 (OP 61)

Title

Unmasking Hidden Chemical Warfare Agents From Novel Phenol-Derived Reaction Products

Author/s

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Abstract

Chlorine-containing Chemical Weapons Convention (CWC) schedule chemicals rapidly react in environmental and decontamination matrices to form non-scheduled phenol-derived products that can serve as forensic markers. We synthesized 13 phenyl-ether reaction products expected from 3 nitrogen mustards (HN1, HN2, HN3) and 10 N, N-dialkylaminoethyl-2-chlorides using corresponding aminoethyl-2-bromide intermediates, and constructed MS and chromatographic data to support their unambiguous forensic identification. Phenyl-ethers were characterized using ESI-HRMS and analyzed by GC-EIMS and GC-CIMS. The GC/EI spectra of 1-13 exhibited M+· ions and structure indicative fragment ions. The selective fragmentation of the alkyl groups bonded to nitrogen enables discrimination of structural isomers. Primary fragmentation involved C-C bond cleavage (α-carbon bonded to nitrogen), giving [M-C7H7O]+ ion as the base peak. The CI method provided clear [M+H]+ ion and reagent specific adducts to confirm molecular weight. GC Retention Indices (RI) were higher than the corresponding parent mustards/aminoethyl-2-chlorides, giving an additional orthogonal identifier. GC-MS and GCRI data provide reliable forensic tool for CWC related investigations.

Keywords

GC-MS; N; N-dialkylaminoethyl-2-chlorides; mustards; phenol reaction products

* Presenting Author

Day 3 - Session 17 (OP 62)

Title

Soil Contamination From Military Activities in South Lebanon: Forensic Investigation

Author/s

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Abstract

Armed conflicts cause long-term environmental legacies, particularly in soils impacted by explosives, heavy metals, and chemical pollutants. South Lebanon, repeatedly affected by warfare, exemplifies agricultural lands that face contamination from military residues. Soil samples were collected in 2022 from 20 post-conflict agricultural zones (0 to 15 cm depth), along with controls (reference areas) for baseline comparison. The research objectives were to quantify heavy metals and explosive residues; characterize their spatial distribution and potential human health risks; and evaluate forensic and remediation approaches. Samples were analyzed using ICP-MS for heavy metals, GC-MS/ECD for organic high explosives. Microbiological analyses examined impacts on microbial diversity and bioremediation strategies. Principal findings indicated the elevated level of non-essential metals (i.e, Ni, Ƥ Pb, Cu, Zn, U, Cd) exceeding the permissible limits. Explosive residues such as TNT, RDX, and HMX were detected (73.6-150 ppb) in several samples, surpassing the permissible limits for agricultural soil even after a decade.

Keywords

Forensic soil analysis; conflict pollution; explosives residues

* Presenting Author

Day 3 - Session 18 (OP 63)

العنوان

التمادي بالأخطاء الطبية في المراكز الطبية الخاصة

المؤلفون

حماد مناحي العنزي*

جهة العمل

المستشار الأمني في الأدلة الجنائية

الملخص

تُعَدّ الأخطاء الطبية في المراكز الخاصة قضية معقدة وتحديًا للنظم الصحية والقانونية، حيث يبرز التمادي في هذه الأخطاء نتيجة غياب الآليات الرقابية والتشريعية الواضحة. تهدف هذه الدراسة إلى استقصاء مظاهر هذه المشكلة وتحديد عوامل تفاقمها، لاقتراح حلول تحافظ على حقوق المرضى. أوضحت الدراسة أن القصور الرقابي، بالرغم من وجود أنظمة رسمية، يسمح بتراكم المخالفات في العيادات والمستشفيات الخاصة، مما يزيد احتمالية وقوع أخطاء جسيمة. بالإضافة إلى ذلك، يواجه ذوو الضحايا صعوبات قانونية معقدة في إثبات الخطأ الطبي، لا سيما في حالات الوفاة، بسبب نقص القوانين المرنة وغياب آليات جمع الأدلة السريعة قبل الدفن، مما يمنح المتسببين هامشًا للإفلات من المسؤولية. ويتفاقم الوضع مع افتقار المجتمع للمعرفة العلمية لجمع الأدلة، وإمكانية التلاعب بالملفات الطبية لإخفاء الإهمال. وتختتم الدراسة بالتأكيد على أن مواجهة هذه التحديات تستلزم تطوير تشريعات حازمة، تكثيف الرقابة الصحية، وضرورة اعتماد أنظمة رقمية مؤمنة لحفظ الملفات، لضمان النزاهة وتعزيز ثقة المرضى في المنظومة الصحية.

الكلمات المفتاحية

الأخطاء الطبية، المراكز الطبية الخاصة، الرقابة الصحية، التشريعات الطبية، الإثبات الجنائي

* Presenting Author

Day 3 - Session 18 (OP 64)

Title

The Role of Smart Forensic Science in Uncovering Drug-Related Crimes

Author/s

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Abstract

Forensic science has advanced significantly with the integration of artificial intelligence (AI) and intelligent digital analysis, greatly enhancing the accuracy and efficiency of crime detection, especially in drug-related offenses. This study explores the role of smart forensic science in detecting and analyzing drug-related crimes in Saudi Arabia, focusing on advanced analytical techniques and digital tools that enable rapid and precise evidence extraction. In this study, we utilize the findings from the analysis of criminal case reports related to drug offenses between 2015 and 2023. We also highlight the role of smart systems used in forensic laboratories, such as machine learning systems for classifying different narcotic substances and analytical software for interpreting various biochemical data (e.g., LC-MS/MS supported by AI technologies). Based on the results, it has been shown that the use of smart forensic science has significantly improved the time required for sample analysis and increased the accuracy of identifying drug types compared to traditional methods. Smart systems have also contributed to detecting tampering attempts in samples through predictive models trained on data from previous similar cases. In conclusion, we recommend expanding smart forensic techniques across all specialized laboratories in the Kingdom, ensuring continuous training for national professionals, and regularly updating technical infrastructure to enhance the criminal justice system's effectiveness and keep pace with evolving criminal methods.

Keywords

Smart forensic science; artificial intelligence; drug crime; evidence analysis; drug control

* Presenting Author

Day 3 - Session 18 (OP 65)

العنوان

نزاهة الأدلة الجنائية: دور المدعي العام بالإشراف على تطبيق البروتوكولات الأخلاقية والتقنية بمسرح

المؤلفون

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جهة العمل

النيابة العامة، المملكة الاردنية الهاشمية

الملخص

يشكل مسرح الجريمة النقطة الأولى والأكثر حساسية في بناء الحقيقة الجنائية، حيث يؤدي أي خلل في جمع أو توثيق الأدلة إلى نتائج قضائية خاطئة قد تمس بمبادئ العدالة، وتنبع أهمية هذا البحث من الحاجة إلى تعزيز الإشراف القضائي - تحديدًا من قبل النيابة العامة - على الإجراءات المتبعة في مسرح الجريمة، لضمان الالتزام بالبروتوكولات الأخلاقية والتقنية عند التعامل مع الأدلة الجنائية، سواء كانت بيولوجية أو رقمية، خاصة ان معظم الانظمة القانونية تعطي المدعي العام سلطة الرقابة والاشراف المباشر على اعمال واجراءات فريق مسرح الجريمة . يركز هذا البحث على خمسة محاور أساسية:

(1) الإطار الأخلاقي للإشراف على فرق المعاينة، مع التأكيد على منع تلوث الأدلة (Biological/Digital Evidence Contamination)، وضمان السرية، لا سيما في قضايا النساء والأطفال.
(2) الرقابة التقنية على استخدام وسائل التوثيق الحديثة كالتصوير ثلاثي الأبعاد وتحليل البيانات الرقمية، وتقييم قبولها قضائيًا وفق معايير مثل (Frye وDaubert).
(3) آليات كشف الانحرافات وتصحيحها، من خلال مراقبة المخالفات الميدانية، ودراسة حالات فساد في الأدلة، وإنشاء نظام المراجعة والتقييم (Peer Review).
(4) التكامل مع التخصصات الشرعية، لضمان انسجام تقارير الخبراء مع الأدلة المادية، وتفسير التناقضات عند ظهورها.
(5) تصميم نموذج إشرافي رقمي عملي (Digital Checklist)، يتضمن قائمة تدقيق رقمية ومؤشرات أداء لقياس جودة زمن الاستجابة لمعاينة المسرح، ونسبة الادلة المرفوضة قضائيا، وقياس مدى الامتثال الأخلاقي.
يختتم البحث بجملة توصيات، منها: تطوير بوابة إلكترونية تتيح للنيابة العامة الإشراف الرقمي على سير المعاينة وتتبع سلسلة حفظ الأدلة، واقتراح ميثاق أخلاقي عربي موحد لفرق مسرح الجريمة، بالإضافة إلى إنشاء لجنة مستقلة لتلقي شكاوى الانتهاكات الأخلاقية والتحقيق فيها. يسعى البحث إلى تقديم إطار عملي يعزز من موثوقية الأدلة الجنائية، ويدعم دور النيابة العامة كحارس للعدالة الإجرائية في مرحلة ما قبل المحاكمة.

الكلمات المفتاحية

الاشراف القضائي على مسرح الجريمة، نزاهة ومشروعية الدليل قضائيًا

* Presenting Author

Day 3 - Session 19 (OP 66)

Title

Development and Validation of a UPLC-QTOF-MS Method for Blood Analysis of Isomeric Amphetamine-Related Drugs

Author/s

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Affiliation

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Abstract

The identification of isomeric drugs is gaining increasing importance in forensics and doping control. Isomers vary in terms of safety, effectiveness, and regulation, particularly for amphetamine-related drugs (ARDs). This study developed and validated a pseudo-isocratic UPLC-qTOF-MS analytical method for the identification of isomeric Amphetamine-related drugs (ARDs) in blood following mixed-mode solid-phase extraction (MMSPE). The procedure requires 250 µL of blood to achieve a limit of quantification (LOQ) and detection (LOD) of 20 ng/mL for all analytes. In aged animal blood samples, extraction recoveries of 63–90% and matrix effects of 9–21% were observed. Precision and accuracy for all analytes were within 20% and 89–118%, respectively. The analytical method was developed and validated in accordance with the Scientific Working Group for Forensic Toxicology (SWGTOX) Standard. It has acceptable accuracy and precision for use in doping control and forensic toxicology.

Keywords

Amphetamine-related drugs; forensic toxicology; blood; UPLC-QTOF-MS; MMSPE

* Presenting Author

Day 3 - Session 19 (OP 67)

Title

Understanding the "Kush" Phenomenon

Author/s

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Abstract

Kush, a form of cannabis, has recently gained popularity across illicit drug markets and networks across the globe. Studies have shown the increase change in potency and novel synthetic cannabinoids present in Kush preparations. This crisis has raised global concern due to the unpredictable and modified chemical composition thus exposing individuals to potential health risks. This study aimed to analyze the chemical composition of Kush from different seized materials in the UAE.. 69 seized samples from forensic cases in Dubai were collected and analyzed. Methanol extraction was performed prior to the sample evaporation under Nitrogen gas at 40°C. Samples were analyzed using gas chromatography-mass spectrometry (GC-MS) as a confirmatory test, using a modified method based on existing forensic protocols. The analysis of seized samples revealed the presence of natural cannabinoids such as delta-9-THC. However, many samples contained modified synthetic cannabinoids. Several synthetic cannabinoids including 4-chloro-MDMB BUTINACA, MDMB-5 methyl INACA, CHM-FUBIATA, ADB-FUBIATA were detected. The detection of unreported compounds in Kush samples is a critical step in the drug surveillance within the UAE and region.

Keywords

Kush; synthetic cannabinoids; GC-MS; amphetamine; cocaine

* Presenting Author

Day 3 - Session 19 (OP 68)

Title

A Case Report of Fatal Topiramate Intoxication: Suicide Overdose

Author/s

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Abstract

Topiramate is a common anticonvulsant used to treat epilepsy and migraine prophylaxis, also prescribed off-label for conditions like bipolar disorder & weight loss. It acts by enhancing GABAergic activity, blocking voltage-gated sodium channels, and inhibiting specific glutamate receptors. We present a case of a 45-year-old female who died by suicide after ingesting topiramate alongside various herbal substances purchased online. A 45-year-old woman was found unresponsive in bed by her husband, who immediately alerted emergency medical services. Paramedics confirmed death, and the incident was reported to law enforcement and relevant authorities, and the body was sent for forensic investigation. Blood and urine samples were collected for toxicological analysis, which included drugs screening, psychoactive substances, alcohol, and volatile organic compounds. No autopsy was performed. Toxicological analysis revealed elevated topiramate levels in the femoral blood (484 mg/L). Therapeutic concentrations of quetiapine, diphenhydramine, amitriptyline, and paracetamol with metabolites were found in urine, along with Methyl salicylate in both blood and urine. Screening and analysis methods were validated following GTFCh guidelines (www.gtfch.org). This case underscores the risks of polypharmacy, when combining prescription medications with CNS active herbal supplements. Death resulted from topiramate overdose. No ethanol, pesticides, hydrocarbons, or organic solvents were detected, excluding other causes.

Keywords

Topiramate; anti-epileptic overdose; suicidal poisoning; methyl salicylate; GC-MS

* Presenting Author

Day 3 - Session 20 (OP 69)

Title

Checklist of Carrion Insects and Their Forensic Importance in Southern Nigeria

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Abstract

Vertebrate carrions when accessible to insects provide unique transient ecosystem that can be useful in forensic evaluation of questionable deaths. This study examined pig carcass decomposition in a grassland ecosystem across dry and rainy seasons (2023–2024), using eight carcasses (four slaughtered, four strangled). Insects were collected manually and with sweep nets, while environmental data were recorded. Fly larvae were measured and reared to record emergence dates. Decomposition duration, insect arrival, and succession were compared across death types and seasons. Forensically relevant Diptera species were identified: (Chrysomya spp., Sarcophaga sp., Musca domestica, Hermatia illucens, Chrysomyza africana), Coleoptera: (Hister monitor, Hister sp., Staphylinus sp., Necrobia rufipes, Dermestes maculatus). Other species of ecological value were Camponotus spp., Doryllus affinis, Carpophilus sp. and Lasioderma sp. Insect decomposition patterns were consistent across causes of death and seasons. Dry season conditions averaged 32.29°C, 56.85% humidity, and 0.18 mm rainfall, while rainy season conditions averaged 29.81°C, 73.13% humidity, and 30.98 mm rainfall. The results except for environmental parameters showed insignificant ($P \geq 0.05$) variations. The study offers insight into carcass decomposition and insect activity in grassland ecosystems, aiding post-mortem interval (PMI) estimation where pathological evidence is limited. Further research is needed to explore insect-environment-carcass interactions.

Keywords

Forensic entomology, pig carcass, insects' invasions, seasonal influence

* Presenting Author

Day 3 - Session 20 (OP 70)

Title

Thermal Effects on the Longevity, Morphological Characters, and Cuticular Hydrocarbons Composition of Dermestes Maculatus Larval Instars

Author/s

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2- King Abdulaziz City for Science and Technology, Riyadh, Saudi Arabia

Abstract

Dermestes maculatus is a globally distributed beetle of forensic importance, particularly in estimating post-mortem intervals (PMI). This study explores larval body measurements (length, width, weight) and cuticular hydrocarbon profiles as indicators of larval age under controlled temperatures (20°C, 30°C, and 40°C). Adult beetles were identified morphologically and confirmed via mtCOI gene analysis. Larvae were reared under standardized lab conditions (60% humidity, 12:12 light-dark cycle) and grouped into 12 experimental sets. Developmental duration, morphometrics, and cuticular hydrocarbons were analyzed using Gas Chromatography-Mass Spectrometry (GC-MS). Results showed that higher temperatures accelerated development and increased larval size. Hydrocarbon profiles varied significantly across instars and temperatures, reflecting changes in composition and complexity. Both morphometric data and hydrocarbon patterns proved reliable for age estimation. Temperature emerged as a critical factor influencing growth rate, morphology, and chemical composition. These findings support the use of cuticular hydrocarbons as forensic biomarkers for determining larval age in D. maculatus.

Keywords

Dermestes maculatus; forensic entomology; PMI; larval orphonology; cuticular hydrocarbons; GC-MS

* Presenting Author

Day 3 - Session 20 (OP 71)

العنوان

إحصاءات جرائم المخدرات في العالم العربي

المؤلفون

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الملخص

تُظهر قاعدة بيانات مكتب مكافحة المخدرات والجريمة بالأمم المتحدة (UNODC)، والتي تحتوي على أكثر من نصف مليون بيان، إحصاءات جرائم المخدرات في دول العالم كافة، متضمنة الدول العربية، ويضطلع البحث بعد تنميط هذه البيانات إلى تحديد أكثر أنواع جرائم المخدرات ارتكابا في العالم العربي، والوسائل التي يتم ارتكاب تلك الجرائم من خلالها، كذلك بيان نوع المخدرات المنتشر في عالمنا العربي، وذلك بغرض إعطاء المشرعين العرب صورة واضحة عن حركة وانتشار المخدرات بين ابنائها، من خلال الاحصاءات الجنائية الواردة في قاعدة بيانات الأمم المتحدة لكل دولة عربية على حدة.

فإنها تظهر في توجيه جهود الأجهزة الأمنية والقضائية نحو أكثر أنواع الجرائم والمخدرات انتشارًا، وتطوير أساليب مكافحة الجريمة المنظمة المتعلقة بالمخدرات، وحماية الشباب والمجتمعات العربية من آثارها المدمرة، إذ ترسم الاحصاءات الجنائية المتعلقة بالمخدرات تفاوتا كبيرا بين كل دولة عربية وأخرى سواء في نوع المخدرات المتعاطاة، أو وسيلة التعاطي على سبيل المثال.

فإن الدراسة تجيب على الآتي: أولا ما هي نسب تعاطي المخدرات في الدول العربية مقارنة بباقي دول العالم؟ ما هو نوع المخدرات الأكثر انتشارا في كل دولة عربية؟

فإنه يقتصر على المنهج التحليلي الذي يعتمد بصورة أساسية لتحليل الاحصاءات الجنائية وبيان مدلولها جغرافيا وزمنيا في قرابة 11 عاما متواليا بين 2011 حتى 2022.

الكلمات المفتاحية

مكافحة المخدرات والجريمة، العدالة الجنائية، قاعدة بيانات الأمم المتحدة، تشريعات عربية، الجريمة المنظمة.

* Presenting Author

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Posters

02-04/12/2025

Abstracts

Day1
02/12/2025

Day2
03/12/2025

Day3
04/12/2025

Poster 1

Title

Comparison of ICP-OES Versus AAS for Determination of Lead in Urine Analysis

Author/s

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Abstract

This study compares inductively coupled plasma optical emission spectrometry (ICP-OES) and graphite furnace atomic absorption spectrometry (GF-AAS) for determining lead in urine, required in forensic and clinical toxicology. Both techniques were assessed for accuracy, precision, sensitivity, robustness, detection limit (LOD), quantitation limit (LOQ), cost-effectiveness, and sample preparation. Spiked urine samples were analyzed to assess recovery rates and matrix effects. GF-AAS showed average recovery of 91%-108%, with 99%mean, while ICP-OES showed 90% and 97%, averaging 98%. Precision was slightly superior for GF-AAS (average RSD: 1.165%) than ICP-OES (average RSD: 1.74%). GF-AAS demonstrated greater sensitivity and lower LOD/LOQ, making it superior for trace lead in biological matrices. both methods were robust across 30 replicates, with no significant difference in recoveries by a T-test ($t = 0.366$, $P < 0.05$). ICP-OES offers faster and multi-element analysis but requires higher operational costs due to argon consumption. In contrast, GF-AAS is more cost-effective for single-element analysis but involves meticulous matrix modification. Both used 2% HNO_3 acid digestion for sample preparation. Overall, both techniques are reliable for lead quantification in urine. However, GF-AAS is slightly favored due to its superior sensitivity, precision, and cost-efficiency in forensic applications. Use depends on resources; further validation needed.

Keywords

ICP-OES; GF-AAS; lead determination; urine analysis; forensic toxicology

* Presenting Author

Poster 2

Title

D1S1656 Allelic Overlap and Artifactual DYS391 Heterozygosity in Single-Source STR Profile: A Case Study

Author/s

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2- DNA and Serology Department, Punjab Forensic Science Agency, Lahore, Pakistan

Abstract

This study reports a rare allelic anomaly observed during routine STR profiling at the Punjab Forensic Science Agency (PFSA), Lahore, Pakistan. The primary objective was to investigate an apparent homozygosity at locus D1S1656 [1, 2] and a concurrent artifactual heterozygosity at DYS391 in a single-source reference sample, highlighting the potential for locus interference or allelic miss-assignment in multiplex STR systems. A buccal swab sample from a male suspect was subjected to nuclear DNA extraction using the organic method. The sample was directly amplified using three commercially STR multiplex kits: Investigator 24plex QS, 21plex STR Fluorescence Forensic DNA Kit and GlobalFiler™ PCR Kit, followed and analyzed using SeqStudio® and GeneMapper® ID-X. Initial analysis with the Investigator 24plex kit indicated homozygosity at D1S1656 (allele 11) and an unusual double peak at DYS391 (alleles 11 and 11.2). Reanalysis with the 21plex kit revealed heterozygosity at D1S1656, identifying allele 11 and an off-ladder variant. Further confirmation with the GlobalFiler™ kit demonstrated a true heterozygous genotype at D1S1656 (alleles 8 and 11), and only a single expected allele at DYS391, confirming the previous heterozygosity as artifactual. This case highlights the importance of multi-kit validation and improved STR chemistry to prevent locus adjacency effects.

Keywords

Null locus; mutation; silent alleles; PFSA

* Presenting Author

Poster 3

Title

Autopsy of Data of Road Traffic Accidents in Sulaymaniyah Province

Author/s

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2- College of Commerce, University of Sulaimani, Sulaymaniyah, Iraq

Abstract

Road traffic accidents (RTAs) are a leading cause of death and injury in Iraq, with Sulaymaniyah governorate experiencing a high rate due to the prevalence of private vehicles. This study aims to identify contributing factors and assess the severity of accident outcomes. A retrospective cross-sectional study was conducted using autopsy data from the Sulaymaniyah Medicolegal Institute, in collaboration with the General Directorate of traffic. The data covers 573 RTAs from September 2019 to August 2020, collected via a structured questionnaire and analyzed using SPSS 11.5. The study found that male drivers, those with less experience, and individuals with low literacy levels are at higher risk. Human error was the primary cause, accounting for 81.3% of accidents—nearly triple the rate of other factors combined. Importantly, the use of safety measures significantly reduced the likelihood of fatal and injury-related outcomes. Educational level, age, and driver behavior significantly influence RTA rates. A strategic approach is urgently needed to mitigate this public health issue.

Keywords

Autopsy data; road traffic accident; drivers; risk factor

* Presenting Author

Poster 4

Title

A Forensic Challenge at D13S317: Multiplatform STR Analysis of a Paternity Dispute Involving a Silent Allele

Author/s

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2- DNA and Serology Department, Punjab Forensic Science Agency, Lahore, Pakistan

Abstract

This case study explores a complex paternity dispute involving a silent allele at D13S317 locus, which initially yielded inconclusive results due to a single locus mismatch. Buccal swab samples from the alleged father, mother, and child were subjected to STR profiling using four distinct commercially available amplification kits with different primer sets. Despite consistent mismatches at D13S317 across all kits, further analysis revealed aberrant relative fluorescence unit (RFU) patterns indicative of a paternal null allele caused by region deletion. The anomaly was confirmed by using different primer sets, in accordance with SWGDAM guidelines. This finding underscores the critical importance of kit diversity, meticulous RFU scrutiny, and population-specific genetic studies when interpreting ambiguous STR results in parentage testing, particularly in the context of rare mutational events.

Keywords

Silent allele; D13S317 locus; paternity testing; mutation; forensic genetics

* Presenting Author

Poster 5

Title

Suicide by Stabbing: A Difficult Diagnosis: A Case Report

Author/s

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Abstract

Suicide remains a significant public health concern, with hanging and firearms being the most frequently used methods. In contrast, suicide by stabbing is exceptionally rare. This case report presents a 27-year-old woman who was discovered deceased in the courtyard of her family home, lying in a pool of blood with multiple stab wounds to the neck, chest, and abdomen. Initially, the severity and number of wounds suggested a possible homicide. However, a detailed examination of the scene, contextual factors, and forensic analysis revealed hesitation marks, grouped and accessible stab wounds, and a lack of defensive injuries. The autopsy confirmed that the cause of death was hemorrhagic shock resulting from a stab wound to the left ventricle of the heart. These findings excluded the possibility of homicide and supported the conclusion that the death was a suicide. The case underscores the diagnostic complexity involved in distinguishing suicide from homicide in rare instances involving stabbing. The photographs included in the accompanying poster presentation visually reinforce the forensic conclusions, offering a scientific foundation for determining that this was a complex suicide rather than a crime of passion.

Keywords

Suicide; stabbing; self-inflicted; forensic medicine

Poster 6

Title

Specimen Validity Testing (SVT) in Urine Drug Monitoring for Illicit Drugs

Author/s

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Abstract

Urine is widely used for drug testing due to its easy collection and longer detection window. However, it is vulnerable to adulteration either in vivo through dilution or diuretic intake, or in vitro by adding substances like bleach or vinegar. In this study, 133 urine samples from workplace settings over 3 months were analyzed for drugs of abuse and Specimen Validity Testing (SVT) using immunoassay (EMIT) and rapid tests. All immunoassay screen-positive urine drug tests were confirmed by Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS). We found that the prevalence of tampering (dilute, substituted, or invalid tests) in urine specimens was 25.4%. The most common drug identified from the workplace specimens was amphetamine, followed by cannabis.

Keywords

Specimen validity testing; amphetamine; cannabis; urine; immunoassay

Poster 7

Title

Assessment of Sexual Dimorphism in All Lumbar Vertebrae Using Three-Dimensional Multi-Slice Computed Tomography Scan

Author/s

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Abstract

Identification is of great importance for legal and humanitarian reasons, as well as for anthropological research [1]. Sex determination is a critical step in identification. This is the first Egyptian study to assess sexual dimorphism across all five lumbar vertebrae using 3D multi-slice CT in 134 individuals. At all levels, six vertebral measurements were investigated, including the upper end plate depth (EPDu), the lower end plate depth (EPDl), the upper end plate width (EPWu), the lower end plate width (EPWl), the anterior height of vertebral body (VBHa) and the posterior height of vertebral body (VBHp) as figure (1) shows Males showed significantly larger vertebral measurements, with specific L1-L4 metrics serving as strong sex predictors in models with AUCs over 0.9. The models incorporating L1 and L2 measurements showed the highest R2 of 0.791 and 0.801, respectively: Log probability of male sex=-51.524 + (5.878 x EPDu L1) + (4.383 x EPWl L1) + (4.309 x VBHp L1) and = -43.971 + (3.057 x EPDu L2) + (3.324 x EPDl L2) + (5.466 x EPWu L2) + (-10.867 x VBHa L2) + (9.699 x VBHp L2). Lumbar vertebrae show age-related, sex-specific changes, highlighting the need for broader model validation.

Keywords

Identification; sexual dimorphism; egyptians; lumbar vertebrae

* Presenting Author

Poster 8

Title

Prevalence and Impact of School Violence in Sidi Bel Abbès, Algeria.

Author/s

Djilali Merzoug Mohammed[1], Boumelik Mohamed Amine[1*], Bensefia Imad dine[1], Dr Mekri Omar [2]

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2. Department of psychiatry, Faculty Taleb Mourad, University Djillali Liabes, Sidi Bél Abbès, Algeria.

Abstract

School violence poses a serious public health issue, impacting students' physical and psychological well-being. In Algeria, data on its prevalence and effects are limited. This study investigates the frequency, injury patterns, and PTSD prevalence among students in Sidi Bel Abbès. A prospective, cross-sectional study was conducted over two academic years, involving 176 students. Data included demographics, physical injuries, and PTSD screening using standardized criteria. The sex ratio was 1:1, and lesion distribution was recorded. All physical injuries were facial, indicating targeted aggression. PTSD was diagnosed in 60% of affected students, revealing a significant psychological toll. The facial injury pattern suggests intentional and humiliating violence. School violence in Sidi Bel Abbès is both prevalent and psychologically damaging. The dominance of facial injuries reflects interpersonal aggression, and the high PTSD rate highlights the need for mental health support, preventive policies, and staff training to identify trauma. Violence affects students of both genders equally, with high rates of facial injuries and PTSD. Prevention should combine physical safety measures with psychological support to reduce long-term harm.

Keywords

School violence; injuries; PTSD; Algeria; public health

* Presenting Author

Poster 9

Title

Artificial Intelligence and DNA in Criminal Investigations

Author/s

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Abstract

Artificial Intelligence is increasingly integrated into forensic science, revolutionizing the use of DNA evidence in criminal investigations. AI-driven tools, including machine learning algorithms, enable forensic experts to analyse complex DNA samples more accurately and efficiently than traditional methods. These tools facilitate the interpretation of low-level, degraded, or mixed DNA samples, which often challenge manual analysis. AI techniques such as probabilistic genotyping use advanced algorithms to assess the likelihood that DNA mixtures contain material from specific individuals, improving identification accuracy in cases with multiple contributors. The adoption of AI in DNA analysis enhances investigative capabilities by automating the processing of large and complex datasets, allowing law enforcement to extract critical genetic information quickly. AI also supports the resolution of cold cases by making it possible to analyse decades-old or difficult samples that were previously unviable for testing. Overall, the integration of AI in forensic DNA analysis marks a significant advancement in criminal justice by enhancing the accuracy and efficiency of investigations. The technology's continued development, alongside the establishment of rigorous validation protocols and ethical considerations, is critical for its successful implementation in forensic science and the criminal justice system

Keywords

Artificial Intelligence; forensic DNA analysis; criminal investigations; legal admissibility; forensic automation

Poster 10

Title

Fluorescence of 1,2-Indanedione-Lysine and Applications for Fingerprint Gender Determination

Author/s

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Affiliation

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Abstract

1,2-indanedione (Ind) is a fingerprint reagent [1-3], it reacts with most amino acids (Aas) present in the fingerprint residue. In this study we will concentrate on its reaction with lysine (Lys) and study the product (Lys-Ind) fluorescence. Dissolved Lys in ultrapure (18.2 MΩ·cm) water was mixed with a methanol (4.10-3M) solution of Ind (50%V/50%V). After complete reaction, absorption, excitation, and fluorescence measurements revealed that Lys-Ind presents stronger fluorescence than other amino acid-Indanedione compounds [4]. It is a broadband spectrum having its maximum around 545 nm with a half width of about 60 nm. The fluorescence time decays of Lys-Ind were calculated using multi exponential fits. Fluorescence decay analysis using linear and logarithmic fits showed the best results with a bi-exponential model, giving distinct lifetime values. These results are different from what we obtained for Ind-L-arginine [5]. Gender determination from latent and fresh fingerprint residue can be achieved by comparing the intensities of the fluorescence peaks and time decays in the same experimental conditions [4]. This is due to the nearly double concentration of amino acids in female fingerprint residue compared to males [6,7], resulting in significantly stronger Lys-Ind fluorescence—potentially aiding gender identification in forensic investigations.

Keywords

Fingerprints; fluorescence; time decay; indanedione; lysine

Poster 11

Title

Fatal Neck Injury Caused by High-Pressure Water Jet: A Forensic Case Report

Author/s

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Abstract

We report a rare case of occupational death due to a high-pressure water jet injury to the neck. A 33-year-old male operator was found unconscious at his workplace with a fatal neck wound. Autopsy revealed combined sharp, puncture, and blunt-force injuries with transection of the left carotid artery, jugular vein, and vagus nerve. Fragments of clothing were embedded in the wound. Scene reconstruction and technical analysis clarified the mechanism of death and excluded foul play. This case highlights the forensic challenges posed by rare industrial accidents and emphasizes the importance of exhaustive scene investigation. High-pressure water jetting is widely used in industrial cleaning but carries significant risk when safety protocols fail. Injuries from these jets can produce complex trauma patterns, posing diagnostic challenges for forensic teams. This case report details an occupational death caused by such an injury, emphasizing the importance of integrating autopsy findings with technical scene analysis. High-pressure water jets can generate injuries that mimic sharp and blunt-force trauma, necessitating careful forensic differentiation. This case illustrates the rarity and severity of such occupational hazards and underscores the need for rigorous investigation of industrial deaths. This case highlights the lethal potential of high-pressure water jet injuries and the importance of combining forensic pathology with technical scene reconstruction.

Keywords

High-pressure water jet, occupational fatality, forensic pathology, neck trauma, industrial accident

Poster 12

Title

Assessment of DNA Persistence on Various Substrates Using Blood, Saliva, and Semen Samples

Author/s

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Affiliation

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Abstract

This study aimed to assess the efficiency of the QIAamp® DNA Mini Kit to recover DNA from blood, saliva, and semen spotted on five varying substrates (wood, tile, plastic, metal, and phone screen) under natural environmental conditions in Riyadh region in Saudi Arabia from February to March, over 30 days. Blood, saliva (10 µL), and semen (5 µL) were applied to surfaces and exposed to natural environmental conditions outside in Riyadh. Samples remained outdoors continuously (24 h/day) for the entire study period under direct environmental exposure in Riyadh. After exposure samples were collected using sterile swabs at four time points. DNA was extracted using Qiagen Mini Kit and quantified using the Quantifiler™ Trio DNA Quantification Kit. All samples were amplified using the GlobalFiler™ PCR Amplification Kit. A deteriorating pattern of DNA concentration was observed over time for blood samples. Tile and wood showed the highest DNA persistence, while phone screens, plastic, and metal yielded lower quantities. For saliva, plastic and tile showed the highest DNA persistence. For semen, plastic and wood showed the highest DNA persistence. The results demonstrated the impact of substrate properties, and exposure time, on DNA persistence & recovery under natural environmental conditions in Riyadh city.

Keywords

DNA persistence; DNA recovery; Qiagen mini kit; forensic genetic

* Presenting Author

Poster 13

Title

Artificial Intelligence and Cybercrimes: Prospects of Digital Forensics Between Challenges and Strategies - A Case Study of Kuwait and Algeria

Author/s

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Affiliation

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2- Department of Political Science - Kuwait University, Kuwait.

Abstract

The rapid advancement of Artificial Intelligence (AI) has reshaped cybercrime, enabling sophisticated threats like deepfakes, adaptive malware, and targeted phishing attacks. This study explores the intersection between AI-driven cybercrimes and digital forensic investigations, focusing on the dual role of AI as both a facilitator of cyber threats and a potential enabler of advanced forensic solutions. By examining the cases of Kuwait and Algeria, the research highlights critical gaps in technological infrastructure, legal frameworks, and human expertise that hinder effective responses to AI-enhanced cybercrimes The study adopts a comparative analytical approach, assessing national strategies, institutional capacities, and legal environments in both countries. Findings reveal that Kuwait has made progress in developing digital forensic laboratories, while Algeria has taken significant steps in strengthening its legal frameworks. However, both countries face persistent challenges related to limited technical expertise, insufficient preventive measures, and weak public awareness of AI-driven threats The research concludes that enhancing digital forensics requires a holistic approach that integrates technological upgrades, continuous training of investigators, stronger legal safeguards, and cross-sectoral as well as international cooperation. Practical recommendations include establishing AI-driven detection systems, harmonizing legal standards for digital evidence, launching nationwide awareness campaigns, and fostering regional collaboration to counter cross-border cyber threats

Keywords

Artificial Intelligence; cybercrime; digital forensics; kuwait, algeria; legal frameworks

Poster 14

Title

Fatal Outcomes of Intracranial Aneurysm Ruptures: A Forensic Autopsy Perspective

Author/s

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Affiliation

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2. Faculty of Medicine, University of Algiers, Algeria.

Abstract

Intracranial aneurysms are often silent vascular malformations, with rupture being the most frequent and dramatic mode of discovery. This study reports two medico-legal autopsy cases of sudden death caused by ruptured intracranial aneurysms, to highlight their forensic implications. We conducted a descriptive case-based analysis of two sudden death victims examined at the Forensic Medicine Department of Laghouat hospital. Complete medico-legal autopsies were performed, with detailed external and internal examinations, focusing on neuropathological findings and vascular lesions. The first case involved a 24-year-old male with a history of congenital heart murmur, who died suddenly after chest pain and loss of consciousness. Autopsy revealed diffuse subarachnoid hemorrhage and a ruptured saccular aneurysm of the basilar bifurcation. The second case concerned a 13-year-old female with no medical history, who collapsed suddenly at home. Autopsy revealed a massive subarachnoid hemorrhage associated with a giant ruptured saccular aneurysm of the right internal carotid artery. Intracranial aneurysm rupture remains a devastating event, frequently discovered post-mortem. Forensic autopsy plays a critical role in establishing the diagnosis, understanding the underlying mechanisms, and contributing to epidemiological knowledge. These cases emphasize the medico-legal importance of recognizing aneurysmal rupture as a cause of sudden death in both young adults and children.

Keywords

Intracranial aneurysm; autopsy; subarachnoid hemorrhage; sudden death

Poster 15

Title

Dipteran and Coleopteran Succession on Buried Carcasses: Implications for Forensic Investigations in Riyadh

Author/s

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Abstract

This study investigated the succession of Diptera and Coleoptera on buried rabbit carcasses in Riyadh, Saudi Arabia, to understand their possible role in ascertaining postmortem interval estimation (PMI) and other forensic applications. Experiments were conducted at two burial depths (20 cm and 40 cm) during two periods: January 28–May 30, 2021 (winter-spring) and September 5, 2021–January 4, 2022 (summer-early winter). Decomposition progressed through three stages (bloated, decay, and drying) in the first period and two stages (decay and drying) in the second. Temperature, humidity, and burial depth significantly influenced decomposition rates and insect abundance. Eleven fly species from five families (Calliphoridae, Sarcophagidae, Muscidae, Phoridae, and Ulidiidae) and four beetle species from four families (Dermestidae, Tenebrionidae, Histeridae, and Nitidulidae) were identified. During the first period, all species were detected at 20 cm (16 species total), while only nine were recorded at 40 cm. In the second period, four fly species were observed at 20 cm and one beetle species, whereas only one fly species was present at 40 cm. The identified insect species serve as reliable forensic indicators, providing crucial information for postmortem interval estimation and improving the accuracy of forensic investigations.

Keywords

Buried rabbit carcasses; cleoptera, diptera; postmortem interval estimation; insect succession; rabbits

* Presenting Author

Poster 16

Title

The Eco Toxicological Evaluation of a Field and Home Organism-Based Pesticides

Author/s

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Abstract

Environmental exposure to pesticides might cause adverse effects on human health. This study aimed to describe the distribution, circumstances, as well as to investigate the assessing risks and regulating organophosphate (OP) insecticide poisoning. Blood samples obtained from five hundred fifty participants over the past few years from 2019 to 2021. These participants are divided into 2 groups: group1, as the patient group (500) and group 2 was the control group of healthy participants with the same age and gender. Patients diagnosed with suspected organophosphate poisoning based on physical and clinical examination and confirmed through laboratory investigations. OP analysis was performed using GC/MS. Toxicity data suggest that organophosphate pesticides are poisonous. This issue was confirmed by the presence of parathion in patients' blood samples (72%; moderate and severe poisoning). The two most recorded circumstances of poisoning were accidental poisoning, accounting for 79 %, and suicide, accounting for 21% of the poisonings. Research has shown the risk factors of pesticide exposure and work practices that may lead to cases of organophosphate pesticide poisoning. The status of pesticide-related diseases reflects the poor safety practices of farmers and the lack of necessary supervision by government agencies. It is recommended that government oversight of household and agricultural pesticides be strengthened.

Keywords

Blood samples; GC/MS; parathion; patients; pesticides

Poster 17

Title

Toxicological Analysis of 59 Postmortem Cases Involving Only Khat From 2014-2024

Author/s

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Abstract

Khat (Catha edulis) contains cathine and cathinone as its main psychoactive compounds. Forensic toxicologists face difficulties interpreting fatal cases involving these substances because validated concentration thresholds are lacking. This study analyzed deaths where only khat alkaloids were present, establishing concentration ranges without interference from other substances. This retrospective study reviewed 59 fatalities involving khat in the Jazan region of Saudi Arabia between 2014 to 2024. Cases were included only when cathine and/or cathinone were the sole detected substances. Tissue samples analyzed included brain, liver, kidney, stomach contents, blood, urine, and any remaining chewed plant material. All 59 cases involved male victims aged 18-60 years (mean 34.1 years). Homicide was the most common manner of death (41.4%), followed by accidental (25.9%) and suicidal (13.8%). 19% cases remained undetermined. This showed cathine/cathinone involvement in violent crimes. Urine samples demonstrated the highest cathine detection rate (76.3%), followed by blood (55.9%) and brain (49.2%). Correlation analysis between tissue types revealed strong relationships. Cathine showed particularly robust correlations between liver and blood samples (r=0.930), stomach contents and urine (r=0.911), and brain and blood (r=0.707). Urine emerged as the most effective sample type for cathine analysis, particularly for confirming recent use. This study provides the first comprehensive concentration ranges for cathine and cathinone in deaths involving only Khat.

Keywords

Forensic toxicology; LC-MS/MS; cathine; cathinone; khat

* Presenting Author

Poster 18

Title

The Prevalence of Drug Poisoning and Overdose in Riyadh, Saudi Arabia

Author/s

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Affiliation

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2- King Khalid University Hospital, King Saud University, Saudi Arabia.

Abstract

Drug poisoning and overdose are growing public health challenges worldwide, contributing substantially to preventable morbidity and mortality. Understanding their patterns in specific settings is crucial for guiding effective prevention and intervention strategies. This study presents a retrospective observational analysis of hospital records, toxicology reports, and laboratory databases from medical institutions across Riyadh, Saudi Arabia. The dataset includes cases from diverse age groups and socioeconomic backgrounds, enabling assessment of the prevalence of drug poisoning and overdose, as well as identification of the most commonly involved substances. Descriptive statistics are used to map demographic and clinical patterns and trends, while regression analysis explores potential risk factors. Ethical approval was obtained from the Second Health Cluster, King Saud University, the Ministry of Health, and the University of Dundee. Findings from this study will provide timely evidence on the scale and nature of drug poisoning and overdose in Riyadh, highlight vulnerable populations, and inform policy development. Ultimately, this work aims to strengthen community health efforts and support targeted strategies to reduce the burden of drug-related harm in the region.

Keywords

Drug poisoning; overdose; prevalence; Riyadh; Saudi Arabia.

* Presenting Author

Poster 19

Title

A Case Report of Fatal Child Abuse

Author/s

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Abstract

The case concerns a Nigerian female child in her first decade of life, initially referred as a natural death due to acute gastroenteritis. Forensic examination revealed otherwise. External examination showed multiple blunt-force contusions at different healing stages, some with impression patterns, traumatic alopecia of the scalp, lacerations of the oral mucosa and nose, as well as numerous scars of varying size and age. Autopsy demonstrated subdural and subarachnoid hemorrhages of different ages, marked brain edema and congestion, localized hemorrhages in the neck and thigh muscles, and petechial hemorrhages in the heart and lungs. Histopathology confirmed an older subdural hemorrhage (≈1 week) and a more recent one, indicating repeated head trauma. Radiology revealed no fractures or foreign bodies, and toxicology was negative. The injuries were blunt in nature, distributed across the body, and of different stages of healing, strongly indicating repeated and severe physical abuse. The cause of death was attributed to multiple blunt-force head injuries and their complications.

Keywords

Child abuse; autopsy; subdural hemorrhage; blunt injuries

* Presenting Author

Poster 20

Title

Comparative Evaluation of HypoProtect Forensic Against Established Decontaminants on Forensic Laboratory Surfaces

Author/s

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Abstract

Contamination in forensic genetics laboratories is a major source of discrepancies in DNA analysis, necessitating rigorous decontamination procedures. This study evaluated the effectiveness of HypoProtect Forensic—a new decontaminant marketed to "denature DNA by 99.9%"—by comparing it with 5% Bleach and 1% Virkon. Mock contamination (blood, saliva, and touch DNA) was deposited in duplicates on five common laboratory surfaces and treated for 30 seconds or 1 minute. DNA was extracted using the Qiagen DNA Investigator Kit, quantified with Quantifiler Trio, and selected samples were amplified using GlobalFiler. The three decontaminants showed differing levels of efficiency. HypoProtect reduced initial DNA concentrations but produced detectable peaks above 50 RFU in 1 of 6 saliva and 7 of 10 blood samples. Virkon lowered DNA quantities across most samples, yet 2 of 7 blood and 1 of 9 saliva samples still amplified above 50 RFU. Bleach proved most effective, yielding almost no detectable DNA and only 1 of 17 amplified samples above 50 RFU. Touch DNA results were inconclusive due to low starting quantities. Overall, Bleach and Virkon outperformed HypoProtect, with Bleach offering the highest level of decontamination.

Keywords

DNA Contamination; decontamination; hypoprotect forensic; bleach; virkon.

* Presenting Author

Poster 21

Title

Data Handling Using R

Author/s

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Abstract

Data management is a critical yet often underemphasised component of forensic science, particularly as practitioners increasingly encounter large and complex datasets. Poorly organised data can hinder interpretation, reproducibility, and long-term usability. This research presents the use of R, an open-source programming language, to address these challenges and provide a systematic framework for forensic data management. R enables a wide range of data operations, from importing and transforming raw datasets to structuring and preserving them with associated metadata. Within the context of forensic science, such workflows enhance transparency, efficiency, and reproducibility. These workflows allow streamlined data handling, perform essential mathematical and statistical calculations, and generate reproducible outputs suitable for operational and research needs. By integrating R into forensic practice, data analysis and management becomes a more robust and transparent process. This study highlights how programming-based approaches can bridge the gap between raw experimental results and organised, interpretable datasets, ultimately strengthening the reliability of forensic science.

Keywords

Forensic science; data management; R programming; metadata.

* Presenting Author

Poster 22

Title

Variation in DNA Shedder Status Between Different Ethnic Groups

Author/s

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Abstract

Shedder status is an individual's tendency to leave DNA behind on touched items or surfaces and is a major factor influencing DNA transfer. Previous studies have attempted to establish individual's Shedder status and biological variables such as age or sex, but none have examined its relation to ethnicity. To study the variation in DNA shedder status among four ethnic groups (African, South Asian, Levantine and Arabian Gulf), 16 female volunteers were recruited. Following standardized washing and abstinence from contact, participants held a plastic handled knife for one minute. A total of 88 touch samples were collected using the double-swab technique. DNA was extracted using Chelex-100, quantified with Quantifiler™ Trio, amplified with GlobalFiler™, and analyzed using SeqStudio® and GeneMapper® ID-X software. Statistical analysis revealed significant difference in DNA quantity ($p < 0.0001$), peak area ($p = 0.0002$) and number of peaks ($p = 0.0004$) between ethnic groups, with Levantines being the highest and South Asian being the lowest shedders. Pairwise comparison between Arab and South Asians ($p=0.1798$), and between Arab and African ($p=0.1536$) revealed no significant difference. Our findings suggest that ethnicity could play a role in shedder status further studies on more ethnicities can be investigated.

Keywords

Shedder status; DNA variation; ethnic groups

* Presenting Author

Poster 23

Title

Evaluation of the Quality of Death Certification in An Algerian Hospital

Author/s

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2- Department of Medicine, Faculty of Medicine, Alger University, Alger, Algeria.

Abstract

The study aimed to assess the quality of death certificate completion in the medico-surgical emergency department of Batna University Hospital (PUMC). Death certificates from a retrospective one-year period (2023) were compared with those from a prospective one-year period (2024), following awareness and training sessions for certifying physicians. The analysis focused on 21 types of errors identified according to WHO recommendations, categorized as writing or medical analysis errors, and further classified as major or minor according to their impact on the validity of the certificate. Before the intervention, all certificates contained at least one error, with an average of seven errors per document, mainly of medical nature. The most frequent omissions involved age (716 cases), date of birth (934 cases), and physician's signature (168 cases). Nearly 79% of certificates showed an incorrect or incomplete causal sequence, and 31% contained an unacceptable cause of death. Comorbidities were omitted in more than 85% of cases, undermining the epidemiological and medico-legal reliability of mortality data. After the continuous training program in 2024, a significant improvement was recorded: completion rates for sociodemographic variables reached between 97% and 99%, and the frequency of major errors decreased by 60% to 80%. The study demonstrates that structured involvement of the forensic physician with practitioners significantly enhances the accuracy and reliability of death certificates.

Keywords

WHO; Death Certificate; Quality; Training;

Poster 24

Title

Critical Role of Forensic DNA Profiling in a Case of Incest and Murder

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Abstract

This case study is based on a murder crime scene examination of a teenage girl. This case was reported in the police station located in Erbil, KRG, Iraq. At first, the case was reported by her family as suicide. A team of forensic experts was called for a crime scene examination. After examination, it was observed that the body had multiple injuries. Victim's brother was identified as the primary suspect. A blood sample and a buccal swab were collected from the suspect. Samples obtained from the evidentiary items (male trousers and scarf) were subjected to DNA profiling. DNA profiles were successfully obtained from the reference samples (victim and suspect) and from the bloodstains on a pair of male pants, which matched the victim's profile using the GlobalFiler™ kit. However, comparison between the suspect's DNA and the female scarf yielded a mixed profile, making interpretation difficult due to the close familial relationship. To resolve this, the YFiler Plus™ kit was used, which confirmed the presence of the suspect's DNA on the scarf, identifying the brother as the possible perpetrator. The case study involved the use of advanced DNA profiling kits, interpretation of evidence at the scene, and a systematic survey of case-related information. This case assessment and interpretation (CAI) provided information to the investigating agency.

Keywords

DNA profiling; Globalfiler kit; Y filer kit; CAI

Poster 25

Title

Retrospective Facial Recognition (RFR): A Critical Tool in Digital Forensics

Author/s

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Affiliation

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Abstract

Retrospective facial recognition (RFR) is emerging as a critical tool in digital forensics, enabling police to analyze stored images and CCTV footage against biometric databases. While it enhances investigative capacity, its use raises unprecedented challenges for evidentiary reliability, legal safeguards, and public accountability. This study examines these challenges in the context of UK policing, with a particular focus on Scotland, where technology is beginning to attract closer regulatory oversight. A thematic review was conducted, synthesizing academic research, case law, policy documents, and oversight reports. The analysis identified three interconnected dimensions. Ethical concerns centered on issues of consent, data protection, and the risks of algorithmic and automation bias influencing officer decision-making. Legal challenges arise from unresolved questions of proportionality, necessity, and compliance with both the European Convention on Human Rights and the UK Data Protection Act 2018. In Scotland, by October 2025 the Scottish Biometrics Commissioner required a governance framework for RFR, marking a significant regulatory milestone immediately preceding this conference. Operational challenges are also evident, including poor image quality, insufficient human oversight, limited training, and weak auditing mechanisms. Notably, more than 98% of RFR searches in Police Scotland reportedly returned no match, raising serious questions about proportionality, effectiveness, and resource allocation.

Keywords

Retrospective Facial Recognition; Forensic Policing; Digital Evidence.

Poster 26

Title

Incidental Autopsy Finding of Mediastinal Angiomyolipoma in a Case of Sudden Death

Author/s

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3- Forensic Medicine services Department, Forensic Medicine services Center in the Northern Border Principality, Arar, Saudi Arabia

Abstract

Cases with rapid fatal outcomes from hemorrhagic shock due to angiomyolipoma are rare in literature. This report documents a peculiar instance of angiomyolipoma leading to fatal hemorrhagic shock after its rupture. This case reinforces the importance of detailed post-mortem examinations in elucidating unusual causes of death, thereby contributing to the broader understanding of AML's potential manifestations. Angiomyolipoma is a benign tumor associated with proliferation of adipose tissue, smooth muscle and thick-walled vessels in variable proportions. A 22-year patient developed persistent severe backache and was taken to a hospital. The patient's condition deteriorated, and he died while emergency treatment was being given. Forensic post-mortem external examinations of the body revealed no signs of any significant external injury. In addition, there were no signs of violence or struggle. Autopsy revealed bleeding and effusions in the chest cavity which was estimated to be 2 liters. Soft, yellow, bloody, fatty tissues and muscle fibers mixed with hemorrhagic foci were seen in the perivascular mediastinum adjacent to the thoracic vertebrae of the spine in the middle of the chest. Histopathological examination confirmed the diagnosis, that it was a case of mediastinal angiomyolipoma which was complicated by massive internal bleeding leading to death.

Keywords

Mediastinal angiomyolipoma; sudden death; autopsy; histopathology

* Presenting Author

Poster 27

Title

Toxicologic Findings in Deaths Examined in Tabuk Forensic Medicine Center: A 4- Year Retrospective Study

Author/s

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3- National Institute of Forensic Medicine, Jordan.
4- Departments of Pathology, Faculty of Medicine, Northern Border University, Arar, Saudi Arabia.

Abstract

Toxicological analysis is vital in medicolegal death investigations and requires correlation with a detailed scene inspection, and the decedent's medical and social history. This study analyzed the deaths with positive toxicology screen in Tabuk region from 2020-2023. A retrospective evaluation of the data of positive toxicological postmortem screen were evaluated by genders, nationalities, ages, type, and place of the medicolegal examination in addition to the recorded cause of deaths. A total of 774 cases were screened for toxins within the study period, with only 120 cases (14.9%) testing positive. Most were males (95.8%) and the age group 30-49 represented 54.2% of cases. Nationals represented 85.8% of cases. Full autopsy was conducted in 583 cases. Unnatural deaths represented 57.5%, including suicide10.8, homicide14.2% and accidents 32.5%. Abuse substances cannabis16.3%, amphetamine 36.7%, and ethyl alcohol 28.3% were detected among positive cases. while carbon monoxide was reported in 27.5% of the studies cases. Pesticides and drugs were detected in only four cases each.

Keywords

Toxicological; medicolegal; drugs; postmortem

Poster 28

Title

Magnetic Resonance Imaging of Calvarial Diploe Thickness for Age Estimation in a Sample of Egyptian Population

Author/s

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Abstract

Magnetic resonance imaging (MRI) is becoming more desirable in forensic identification. This study aimed to investigate whether age could be estimated based on Calvarial Diploe Thickness (CDT) using MRI in a sample of the Egyptian population. The study was conducted on cranial MRI images of 306 adult Egyptians. For age estimation, seven CDT measurements were assessed on 256 cranial MRI images of known sex and age. Multivariate linear regression analyses were performed to generate age prediction equations. All regression equations were tested on 50 cranial MRI images. Pearson correlation showed no statistically significant correlation between age and all CDT measurements. Age prediction multivariate linear regression models (sex-stratified/sex-pooled) were statistically insignificant, with very low adjusted r2 and high standard error of estimate. Testing the multivariate linear regression equations showed Mean Absolute deviation (MAD) between the chronological age and predicted age of 9.09254 years and Mean Absolute Percentage Error (MAPE) of 28.458% for the multivariate linear regression equation and MAD of 8.94469 years, and MAPE of 279829% for the multivariate linear regression equation. We concluded that the studied CDT measurements are unfavorable for MRI-based age estimation for Egyptians. We recommend future studies to compare the accuracy of other imaging modalities.

Keywords

Calvarial diploe thickness; age estimation; Magnetic Resonance Imaging; Egyptians

* Presenting Author

Poster 29

Title

Fatal Perforating Air Gun Injury: A Case Report

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Abstract

Air guns are non-powder guns that employ compressed air to release the projectile. They may function through a spring or pneumatic "hand-pump" mechanism or by supplemental CO2 delivery. The projectile can be cylindrical or spherical. Air guns are frequently used for hunting, even by children. Air gun injuries are often underestimated, although modern high-velocity air guns can cause lethal outcomes. From the Forensic perspective, assessment of air gun injuries is challenging as the combustion-related wounds in the case of firearm injuries are missing. A 47-year-old male received a perforating gunshot wound to the right side of the chest. Clothing examination revealed a small hole with fibers directed inwards and no gunshot residue. X-ray examination displayed a single radiopaque foreign body in the stomach. Following the trajectory of the projectile in the body, a fracture of the right sixth rib was found; the projectile perforated the right side of the heart, penetrated the diaphragm, and landed in the stomach, where it was retrieved. Although air guns can cause fatal injuries, their increasing use necessitates firearm-like legislation, as in this case, where an air gunshot perforated the heart and caused death.

Keywords

Wound; air gun; death; heart

* Presenting Author

Poster 30

Title

دمج الذكاء الاصطناعي التوليدي مع الأدلة الجنائية الرقمية لإعادة بناء جداول زمنية معقدة للهجمات السيبرانية في البنية التحتية الحيوية

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2 - كلية علوم الأدلة والتحقيقات الجنائية، جامعة نايف العربية للعلوم الأمنية، الرياض، المملكة العربية السعودية

Abstract

تهدف هذه الدراسة إلى تقييم فعالية دمج أدوات الذكاء الاصطناعي التوليدي مع أساليب التحقيق الجنائي الرقمي لإعادة بناء سيناريوهات معقدة للهجمات السيبرانية التي تستهدف البنى التحتية الحساسة، وتحسين دقة التحليل الزمني وتقليل الفجوات الناتجة عن التشفير أو حذف الأدلة. تم تطوير نموذج يعتمد على شبكات الخصومة التوليدية ونماذج المحولات لتوليد محاكاة مبنية على بيانات رقمية جزئية مستخلصة من ثلاث هجمات نموذجية: تعطيل الخدمة، التسلل الداخلي، والبرمجيات الخبيثة. تمت مقارنة نتائج إعادة البناء باستخدام الذكاء الاصطناعي مع الطرق التقليدية المعتمدة على تحليل السجلات اليدوي. أظهرت النتائج تفوق النماذج التوليدية في دقة إعادة البناء بنسبة 91%، 89%، و87% مقابل 72%، 68%، و64% للطرق التقليدية على التوالي، مع تحسن واضح في معدل استرجاع البيانات المفقودة وتقليل الفجوات ضمن تسلسل الأحداث. خلصت الدراسة إلى أن توظيف الذكاء الاصطناعي التوليدي يعزز كفاءة وموثوقية التحقيقات الرقمية، خصوصًا في الهجمات المعقدة على البنى التحتية الحرجة، مما يُسهم في تسريع عمليات التحقق ورفع دقة النتائج ضمن معايير تضمن موثوقية الأدلة أمام الجهات القضائية.

Keywords

الذكاء الاصطناعي التوليدي، التحقيق الجنائي الرقمي، الهجمات السيبرانية، البنية التحتية الحرجة

* Presenting Author

Poster 31

Title

Unique Nanoparticle-Approach to the Advancement of Forensic Detection Systems in the Modern Era

Author/s

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Abstract

The fabrication of fluorescent nanoparticles and the application of modern analytical methods have lately emerged as rapidly evolving technologies in criminal investigation. Our study concentrates on the economical and sustainable synthesis of carbon nanomaterials, encompassing carbon nanoparticles, carbon nanotubes, graphene, and graphene oxide. Nanoparticles exhibit exceptional fluorescence capabilities and minimal toxicity, rendering them an innovative instrument for detecting fingerprints on various surfaces. We evaluated synthetic methods for carbon samples derived from accessible basic sources. Biochar is a solid carbon derivative obtained from biomass, including rose debris and date palm fronds, demonstrating unique microstructural properties and also elevated electrical conductivity. To assess the quality of synthesized carbon nanostructures for fingermark detection, various analytical techniques are employed, including scanning electron microscopy (SEM), transmission electron microscopy (TEM), Raman spectroscopy, X-ray diffraction, Also use photoluminescent spectroscopy (PL). Biochar has emerged as an eco-friendly and economical precursor for the synthesis of luminous carbon nanostructures. Carbon nanoparticles, function as light emitters, acquiring distinctive visual enhancement signatures and providing significant contrast against multicolored and patterned backgrounds. The synthesis of carbon nanoparticles from biochar by high-energy ball-milling methodology demonstrates potential in fingerprint detection, as it utilizes fluorescence technology, enabling criminal investigators to operate with more precision and speed.

Keywords

Biochar; carbon nanoparticles; fluorescence; fingerprint; forensic

* Presenting Author

Poster 32

Title

Optimizing DNA Recovery From Drug-Related Evidence: Comparative Evaluation of Sample Collection Techniques

Author/s

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Abstract

The recovery of DNA from unconventional forensic evidence, like drug injection equipment, remains a significant challenge for forensic laboratories due to sample degradation and contamination. This study aimed to evaluate and compare four sample collection solutions—Phosphate-Buffered Saline (PBS), DEPC-treated water, Wet swab (1), and Low Tris-EDTA buffer (2)—at different time intervals to determine the most effective method for DNA recovery from drug-related syringes. Blood samples were introduced into sterile syringes and subsequently expelled to simulate drug-related evidence, and the residual blood was collected using the four approaches. DNA extraction was performed at three-time intervals immediately (0 days), after 4 days, and after 8-10 days of storage—to evaluate temporal effects on DNA stability. The recovered DNA was quantified and subjected to short tandem repeat (STR) profiling to assess yield and profile quality. The results demonstrated that the wet swab method consistently produced higher DNA yields and more robust STR profiles suitable for comparison and suspect identification. Overall, the results highlight that wet swabbing provides superior DNA recovery compared to PBS, DEPC-treated water, or Low Tris-EDTA, and adopting optimized collection methods can enhance case resolution rates, reduce laboratory rework, and improve the judicial value of forensic evidence.

Keywords

DNA recovery; Drug-related evidence; Sample collection techniques; STR profiling

Poster 33

Title

Amelogenin Deletion and Its Implications in Y-STR Based Male Identification: A Forensic Genetic Perspective

Author/s

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Abstract

Amelogenin based sex determination widely documented across various populations, commonly used in forensic DNA analysis. Such deletions, although rare, have been reported in certain populations at notable frequencies underlining limitations of relying solely on the Amelogenin marker for gender determination. The objective of this study was to analyse and evaluate the pattern of allelic dropout of Y chromosomal STR markers and their relation between Amelogenin Y deleted males independent of factors related to fertility or maleness. A total of 3268 samples received for paternity testing at Ingenomics Private Laboratory were analyzed using the Ingenomics™ Autoprofiler Kit Results were validated with PowerPlex® 21, GlobalFiler™, PowerPlex® Y23, Ingenomics™ Y Profiler STR, and Microreader™ 26RM-Y Plex ID systems. Haplogroup prediction was performed using NevGen Software In 29 sample Amelogenin Y dropout observed and only one sample with amelogenin X dropout out of 3268 analyzed samples was observed, these three kits comprised a total of 53 Y STR markers. 10 Y-chromosomal STR markers drop out occur during this analysis. Most affected individuals belonged to the J2 lineage, particularly J2b, suggesting a large inherited deletion rather than mutation or fertility-related factors. These findings demonstrate importance of incorporating additional Y-STR markers for accurate forensic and paternity interpretations

Keywords

Amelogenin deletion; ingenomics Y Profiler; J2 Haplogroup; paternity cases; RM- Y markers

* Presenting Author

Poster 34

Title

Specialized Consultation for Childhood Violence: Retrospective Study at the Forensic Medicine Department, Mustapha Hospital

Author/s

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2- Forensic Medicine Department, Mustapha University Hospital, Algiers, Algeria

3- University of Health Sciences, Algiers, Algeria

Abstract

Childhood violence is a pressing public health and social concern. However, its recognition and management remain limited in many health systems. This raises a central question: How can specialized consultations in forensic medicine improve the identification, documentation, and care of child victims of violence? This study aimed to evaluate the role and effectiveness of a specialized consultation dedicated to childhood violence. The focus was to describe the demographic and clinical profiles of child victims, assess the types of violence encountered, and highlight the medico-legal interventions provided. A retrospective study was conducted over a defined period, analyzing medical records of children under 18 years who attended the specialized consultation. Data included age, gender, type of violence (physical, sexual, psychological, or neglect), referral sources, clinical findings, medico-legal documentation, and subsequent social or judicial actions. Statistical analysis was performed. 116 cases were reviewed. Most victims were aged between 6 and 15 years, with a slight female predominance. Physical abuse accounted for the largest proportion of cases, followed by sexual violence and psychological maltreatment. Comprehensive medico-legal examinations were systematically performed, often including radiological or psychological assessments. Specialized consultation proved to be a critical tool in ensuring rapid, multidisciplinary, and tailored care for child victims.

Keywords

Childhood violence; forensic medicine; specialized consultation; child protection.

* Presenting Author

Poster 35

Title

Sex Identification Based on Sacrococcygeal Dimensions Using Multi-Detector Computed Tomography

Author/s

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2- Department of Radio-diagnosis, Faculty of Medicine, Suez Canal University, Ismailia, Egypt

Abstract

The pelvic bones, particularly the coccyx and sacrum, are known to be the most useful for sexual dimorphism specially for unknown skeletal remains and mutilated bodies. This study reports the use of Multi Detector Computed Tomography (MDCT), to determine coccygeal and sacral osteometric differences between adult male and female Egyptian individuals. 220 subjects were included in this study (110 males and 110 females) who underwent pelviabdominal CT at, Suez Canal University Teaching Hospitals. Ten dimensions of the sacrum and coccyx for each participant were obtained and assessed for sexual dimorphism. For males, every dimension was greater than women, except for the maximum breadth of alae of the sacrum (MBA) and the sacrococcygeal curve angle (SCCA). Antero-posterior diameter of the first sacral vertebra (APD) followed by anterior sacrococcygeal length (ASCL) provided accuracy of 74.55% and 72.73% respectively for sex determination using receiver operating characteristics (ROC) analysis. The Binary logistic regression (BLR) model correctly classified 87.3% of males and 85.5% of females, with an overall classification accuracy of 86.4%. The regression formula had a sensitivity of 83.6%, specificity of 82.7% and accuracy of 83.6%. The study demonstrated notable variations between males and females, which might be helpful in sex determination.

Keywords

Sex identification; sacrococcygeal dimensions; accuracy; Egyptian

* Presenting Author

Poster 36

Title

Compounds Targeting the Ecdysone Receptor EcR of Chrysomya Albiceps to Inhibit Molting and Metamorphosis: A Novel InSilico Strategy for PMI Manipulation Analysis

Author/s

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Abstract

The reliability of post-mortem interval (PMI) estimation in forensic science relies on accurately tracking blowfly development, particularly Chrysomya albiceps, whose molting is controlled by the hormone 20-hydroxyecdysone (20E) via its receptor (EcR). Binding of 20E to EcR initiates the genetic cascades governing metamorphosis; Hence, EcR represents the molecular keystone linking insect development to PMI accuracy. This study presents a first-of-its-kind in silico forensic framework to identify compounds that disrupt EcR signaling, addressing potential manipulation of PMI through endocrine interference. A high-fidelity homology model of C. albiceps EcR was built and screened through a multi-tiered computational pipeline integrating molecular docking, dynamic pharmacophore modeling, quantum mechanical profiling (DFT/B3LYP/6-31G*), and Non-Covalent Interaction (NCI) analysis via Reduced Density Gradient (RDG) mapping. Theaflavin exhibited the strongest EcR binding (-8.7 kcal/mol), stabilized by extensive hydrogen bonding and van der Waals interactions, confirmed by Molecular Electrostatic Potential mapping and its low HOMO-LUMO gap (4.21 eV). Pharmacophore-based PCA classified high- versus low-affinity disruptors, offering a predictive tool for future screening.

Keywords

Chrysomya albiceps; ecdysone receptor; post-mortem interval (pmi); forensic entomology; molecular docking

Poster 37

Title

Simultaneous Determination of Fenethylline and Its Metabolite Amphetamine in Human Blood by GC-MS

Author/s

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Abstract

Fenethylline is a theophylline derivative of amphetamine-type substances. Fenethylline undergoes extensive biotransformation to yield amphetamine and theophylline as its primary metabolites. This study presents a gas chromatography-mass spectrometry (GC-MS) method for the simultaneous quantification of fenethylline and its metabolite in human blood. Analytes and an internal standard (amphetamine-d_5) were extracted from 0.5 mL of blood using 1-chlorobutane at pH 14. The dried extracts were derivatized with heptafluorobutyric anhydride (HFBA) at 70 °C for 30 min and analyzed in selected ion monitoring (SIM) mode. The monitored ions were m/z 91, 118, and 240 for amphetamine; m/z 118, 266, and 446 for fenethylline; and m/z 122, 123, and 244 for amphetamine-d_5. Calibration curves were linear over the concentration range of 10–1000 ng/mL for both analytes, with coefficients of determination (r^2 = 0.99). The limits of detection (LOD) and quantification (LOQ) were 5 ng/mL and 10 ng/mL, respectively. Precision (%RSD) ranged from 1.07 to 9.76, while accuracy (%Bias) was within −9.97 to 8.90 for both compounds. Extraction recoveries were 101.2% for fenethylline and 94.6% for amphetamine. Both analytes remained stable in blood samples for 24 h under room temperature, 4 °C, and −20 °C storage conditions, with concentration changes of less than 5%.

Keywords

Keywords: Fenethylline; amphetamine; blood; GC-MS

Poster 38

Title

Sudden Cardiac Death in the Young: A Forensic Perspective on Causes and Emerging Diagnostic Tools

Author/s

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2- Cameron Forensic Medical Sciences, Centre for Clinical Pharmacology and Precision Medicine, William Harvey Research Institute, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, United Kingdom.

Abstract

Sudden cardiac death (SCD) in young individuals is defined as unexpected natural death due to cardiac cause. We explore the etiology of SCD in young adults, emphasizing both primary categories of SCD. Coronary atherosclerotic disease accounted for 18% of SCD. Non-coronary causes include structural and nonstructural conditions. Structural heart diseases such as cardiomyopathies and congenital anomalies are most prevalent. Many SCDs are caused by arrhythmic disorders, which may have normal gross and histological findings thereby complicating the postmortem diagnosis. Autopsy is the gold standard to identify the cause of death. It must be performed with a systematic and standardized approach. Genetic disorders leading to SCD can be identified by molecular autopsy, which is a novel approach for those conditions, especially in cases of unexplained autopsies. Such findings may help in guiding the family screening and preventive strategies for at-risk surviving relatives. AI also plays a significant role in performing the risk assessment of an individual. We highlight the necessity of adopting a multidisciplinary approach with improved cardiovascular pathology training, autopsy procedure and utilisation of genetic testing. There is also a need to reclassify the variants of uncertain significance, as there is a significant challenge in distinguishing these variants from others.

Keywords

Sudden cardiac death; autopsy; molecular autopsy

Poster 39

Title

Understanding Post-Mortem Toxicology Through Demographic and Circumstantial Factors: Improving How Drug Involvement in Deaths is Interpreted

Author/s

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Affiliation

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Abstract

This study aimed to build a detailed database that includes these factors to make post-mortem toxicology interpretation more accurate. Data from the National Programme on Substance Use Mortality (NPSUM), which records coroners' reports of deaths involving psychoactive drugs in the UK. Cases reported up to November 2021 were reviewed, including only drugs with at least five post-mortem blood results. Each case was coded by demographic data, prescription status, and whether the drug contributed to death or was found incidentally. Statistical analysis and visualisation were performed using SPSS, Excel, and PowerBI, with methadone as an example. Ninety-one psychoactive drugs met inclusion criteria. Methadone levels varied greatly by case circumstances. Median concentrations were higher when methadone caused death than when it was not. Concentrations were higher when methadone was the sole drug, and the person had an active prescription. Higher values were also seen in females, older adults, and people of Asian background. Post-mortem drug levels vary depending on personal and situational factors. Using a single "toxic" range for all people may lead to wrong conclusions. The new NPSUM database, which organises data by age, gender, ethnicity, and cause of death, offers a stronger and fairer basis for interpretation in forensic toxicology.

Keywords

Post-Mortem; toxicology; drug; demographic; circumstantial factors

Poster 40

Title

From Evidence to Excellence: Reimagining Postgraduate Forensic and Medical Sciences Education for the 21st Century

Author/s

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The London School of Medicine and Dentistry, Queen Mary University of London, United Kingdom

Abstract

The future of postgraduate education in forensic sciences and forensic medical sciences must evolve to meet the demands of a rapidly changing professional and societal landscape. Advances in analytical technologies, integration of artificial intelligence, and global complexity in drugs, crime, and medico-legal investigations require graduates to possess deep technical expertise alongside adaptability, leadership, and ethical resilience. This poster explores a forward-looking model of postgraduate training built around competency-based outcomes, stackable micro-credentials, and authentic, practice-centered learning. Key themes include simulation-based teaching in clinical and laboratory contexts, interprofessional integration with law and public health, and assessments that measure real-world competence, from OSCE-style evaluations to courtroom testimony. The central role of AI in shaping forensic practice is addressed, emphasizing critical validation and management of emerging digital tools. Clinical forensic medicine requires focus on trauma-informed care, safeguarding, and medico-legal interface, while toxicology and digital forensics demand reproducibility, data literacy, and quality assurance. Embedding research through capstone projects, reproducible workflows, and collaborations with practice partners ensures graduates are directly advancing the field.

Keywords

Forensic education; training; artificial intelligence; postgraduate curriculum

Poster 41

Title

Cold Case Closure via Friction Ridge Analysis - A Forensic Breakthrough

Author/s

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Abstract

We present a case involving the tragic death of a Chinese male found in an abandoned construction area, fingerprints were decomposed and no evidence was found near the body except a black plastic bag wrapped around the deceased's neck. The autopsy revealed that it is a homicide case. Fingerprint experts were summoned to take the prints and secure the black plastic bag. Latent fingerprint analysis remains a critical tool for forensic identification, even in challenging scenarios involving decomposed human bodies. This case study explores the effectiveness of investigating a decomposed body by the advanced fingerprint recovery techniques. The investigation team employed a multi-step approach using cyanoacrylate fuming followed by the Ardrox treatment to develop prints on the non-porous plastic bag recovered from the scene. This approach successfully yielded fingerprints from both the interior and exterior of the plastic bag. Further, recovered fingerprints were analyzed and compared using Automated Fingerprint Identification System (AFIS), which helped in positive identification to a suspect from another crime scene. Despite the challenges associated with decomposition, fingerprint recovery methods played a crucial role in identifying the culprit.

Keywords

Fingerprints; ardrox; cyanoacrylate, AFIS,

Poster 42

Title

Illicit Cryptocurrency Use by Arabic-SpeakingActors on the Deep and Dark Web

Author/s

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Affiliation

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Abstract

Theconvergence of anonymity-enhancing technologies has facilitated the rise of illicit activities across the globe. This study investigates this phenomenon focusing on Arabic-language content collected from major Deep Web platforms and Dark Web environments. Using advanced deep/dark web search tools we identify cryptocurrency-enabled illicit activities in the relevant Arabic content indexed recently during the last twelve months (Jul 2024-Jun 2025). In addition, we utilize open-source intelligence (OSINT) techniques and specialized tools to analyze the associated cryptocurrency transactions, delivering insights that provide enhanced understanding of the intersection between digital finance and criminal activities. Several key findings were revealed regarding the distribution, prevalence, and financial exploitation of various cryptocurrency types. We observed a clear distinction in the digital behavior of actors based on coin type. Pseudonymous coins like Bitcoin (BTC) and Tether (USDT) were primarily associated with high-volume, potentially fraudulent schemes (e.g., unverified humanitarian aid solicitations). In contrast, privacy coins such as Monero (XMR) and Zcash (ZEC) were predominantly leveraged on highly anonymous platforms like Tor, for more sensitive illicit activities such as terrorism financing.

Keywords

Cryptocurrency; dark web; deep web; OSINT

Poster 43

Title

AI-Driven Network Forensics Framework for Accurate Detection of WannaCry Ransomware Using Deep Learning

Author/s

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Abstract

The escalating threat of ransomware, particularly the devastating impact of variants like WannaCry, has underscored the urgent need for intelligent and precise detection systems capable of operating in dynamic threat environments. In this study, we propose DeepRansom, a novel deep learning framework specifically designed for accurate and interpretable detection of WannaCry ransomware among a diverse array of malware families. The core innovation of DeepRansom lies in its dual-model architecture, which synergistically combines TabNet's built-in feature selection with the FT-Transformer's contextual learning capability, enabling both high-performance classification and instance-level interpretability. We evaluate our model on a curated ransomware dataset comprising 21,752 samples spanning 26 malware families, including 11 major ransomware strains. Our experiments formulate WannaCry detection as a binary classification task and demonstrate that DeepRansom significantly outperforms conventional machine learning classifiers (e.g., Random Forest, SVM, XGBoost) and standalone deep learning models. The framework achieves an accuracy of 99.82%, a precision of 97.89%, a recall of 93.94%, and an AUC of 0.99, while maintaining low false positive rates and high generalization. Furthermore, SHAP-based interpretability analysis reveals that the model's decisions are grounded in meaningful behavioral and structural features, enhancing trust in high-stakes cybersecurity operations.

Keywords

Network forensics; deep learning explainable AI (XAI); FT-Transformer; malware detection

Poster 44

Title

Enhancement of Latent Fingerprint Detection Using Surfactant-Functionalized Silica Nanoparticles.

Author/s

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3- Alborj Diagnostic Laboratories, Jeddah, Saudi Arabia

Abstract

Latent fingerprints (LFPs) are one of the important tools in crime scene investigations. Silica nanoparticles (Si-NPs) are promising platforms that can be applied to various applications including LFP. This study aimed to synthesize nonporous and porous Si-NPs using different surfactants (Tween 20, a mixture of Tween 20 and Tween 80, and Aerosol-MA1 (AM1) to evaluate their effectiveness in detecting LFP. Si-NPs were prepared using three distinct concentrations of ammonium hydroxide (NH_4OH) (0.150, 0.125, and 0.100) The goal of this study to produced Si-NPs smaller than 250 nm to increase the surface area, so the desired concentration of 0.100 M NH_4OH was chosen. The size distribution of nonporous Si-NPs was 50.6 ±2.8 nm. For the surfactants-embedded Si-NPs, the largest particle size was observed with AM1-embedded Si-NPs (217 nm ±8.0 nm), followed by those embedded with Tween 20 (113.3 ±1.6 nm), and a mixture of Tween 20 and Tween 80 (110 nm ±2.0 nm). After the surfactant's removal, the size property of Si-NPs for Tween 20, Tween20-Tween80 and AM1 were (136.9 ±2.6, 0.09 ±0.0), (142.2 ±2.4, 0.08 ±0.01) and (180.8 ±6.0, 0.09 ±0.03) respectively. For fingerprint detection, AM1-modified Si-NPs powder produced the highest quality fingerprints patterns and ridge characteristics. This study highlights the potential of Si-NPs, particularly AM1-modified Si-NPs, as an effective and safer alternative for forensic fingerprint analysis.

Keywords

Latent fingerprints; silica nanoparticles; surfactant-embedded nanoparticles.

Poster 45

Title

High-resolution mass spectrometry for characterising, differentiating, and linking soils in forensic investigations.

Author/s

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Affiliation

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Abstract

Discriminating between soils can provide compelling evidence for crime-scene investigations where the transfer of soil from the environment to items of forensic interest has occurred. Soil contains an ultracomplex mixture of organic compounds with thousands of chemically distinct structures and functionalities. These complex mixtures can serve as chemical fingerprints, making them valuable in forensic investigations where determining the geographical origin of soil is crucial. This study focuses on method development for forensic soil discrimination using lipid analysis and direct infusion high-resolution accurate mass spectrometry (DI-HRAM-MS). Various solvents and ionisation modes were tested to refine the methodology. Principal component analysis (PCA) based on discriminant lipid entities successfully yielded separable clusters. To overcome these challenges, this research explored DI-HRAM-MS as an alternative, rapid, and high-throughput method for soil characterisation. Unlike GC-based techniques, DI-HRAM-MS requires minimal pre-analytical processing and provides data in just a few minutes using only the m/z and abundance domains. This research tested if DI-HRAM-MS offers a more efficient and accurate approach for soil discrimination compared to traditional methods. We demonstrated that negative mode ionisation provides clear and consistent clustering of soil samples through PCA. These findings highlight the potential of DI-HRAM-MS as a robust method for forensic and environmental investigations, enabling the differentiation of geographically distinct soils with minimal sample preparation and significantly faster analysis times.

Keywords

Forensic geolocation, orbitrap, soil, mass spectrometry.

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Workshops

02-04/12/2025

Workshop

Disaster Victim Identification

Pitfalls and Pearls

Tuesday 2nd Dec. 2025

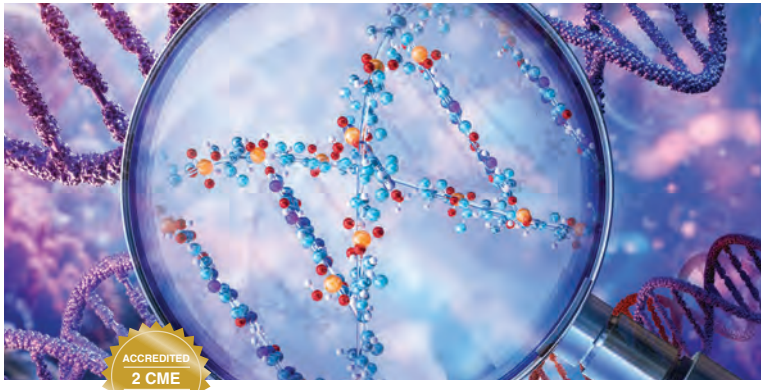
Presenters

Mr. Charles Lamens

Mr. Lamens is one of the most experienced DVI specialists working with Interpol who has been involved in major investigations where DVI was required.

Target Audience:

Disaster Victim Identification specialists, crime scene investigators, investigating agencies, criminalists, forensic scientists; students attending forensic programs science



Workshop

Sketching the Unknown:
Forensic DNA Phenotyping (FDP) in Practice

Tuesday 2nd Dec. 2025

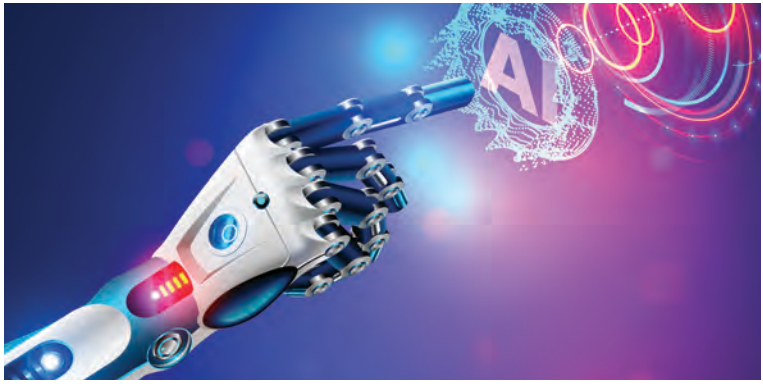
Presenters

Dr. Marta Diepenbroek

Dr Marta Diepenbroek is an experienced practitioner in Germany. She has worked in forensic genetics and has been part of the teams to identify human remains in Poland and has managed Polish DNA database. She is researching and implementing new methods in forensic genetics including single cell analysis and Forensic DNA Phenotyping for identifying humans.

Target Audience:

Forensic geneticists; forensic scientists; students attending forensic science programs



Workshop

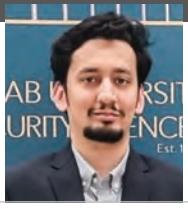
Artificial Intelligence and Machine Learning Applications in Forensic Sciences:

Concepts, Tools, and Emerging Trends

Tuesday 2nd Dec. 2025

Presenters

Dr. Qazi Emad Ul Haq



Mr. Muhammad Hamza

Dr Qazi Emad ul Haq has a PhD from the Kingdom of Saudi Arabia and has researched and practiced AI for several years. Mr. Muhammad Hamza is also an AI researcher and practitioner. Both have published large number of scientific papers in the field of AI.

Target Audience:

Cybersecurity professionals; AI researchers; students in cybersecurity and AI-related fields; law enforcement involved in cybercrime investigations.

Workshop

Methamphetamine in Focus:
Scientific and Forensic Implications

Tuesday 2nd Dec. 2025

Presenters

Dr. Ahmed Al Asmari

Dr. Torki Zugaibi

Dr Ahmed Al Asmari is a well-known and highly experienced forensic toxicologist and researcher in the Kingdom of Saudi Arabia. He has published heavily on forensic toxicology issues within the MENA region. Dr Torki Zugaibi is a US trained forensic toxicologist and is an active researcher. He has also published on Methamphetamine and other forensic toxicology issues.

Target Audience:

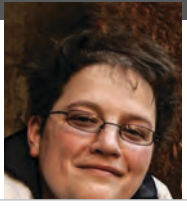
Forensic Toxicologists; toxicologists; forensic chemists; forensic scientists; students attending forensic science programs.

Workshop

The Use of Virtual Reality in Crime Scene Training and Investigation

Wednesday 3rd Dec. 2025

Presenters



Prof Niamh Nic Daeid

Mr Vincenzo Rinaldi

Prof Niamh Nic Daeid is an experienced forensic scientist, and she has worked in the field for 30 years of experience. Mr. Vincenzo Rinaldi is working as a researcher with Prof Niamh to develop VR tools at Leverhulme Research Centre for Forensic Sciences. Vincenzo Rinaldi is a VR/AR application specialist.

Target Audience:

Forensic practitioners; forensic scientists; students attending forensic science programs; academic researcher/lecturer.

Workshop

Revealing the Invisible:
The Crucial Role of Trace Evidence

Wednesday 3rd Dec. 2025

Presenters

Mr. Khalid Sajjad Feras

Mr. Feras is a forensic trace chemistry specialist, having 15 years of forensic casework experience in an accredited laboratory. Trained in the USA and internationally recognized, he has examined, reported, and testified hundreds of forensic cases involving GSR, ignitable liquids, explosives, and micro-trace materials. Mr. Feras is an active member of AAFS, ASTEE, IAI, and NAFI.

Target Audience:

Trace chemists; general chemists; forensic scientists; students attending forensic science programs.

Workshop

Integrating Cybersecurity and AI:
Tackling Cybercrime with Machine Learning.

Wednesday 3rd Dec. 2025

Presenters

Dr. Kyounggon Kim

Dr Kyounggon Kim is a well known Cybercrime and Digital Forensics specialist having served several professional organizations in Korea. He is an active researcher in Cybercrime, Digital Forensics and Artificial Intelligence. He is now the Head of Department of Cybercrime and Digital Forensics at NAUSS.

Target Audience:

Cybersecurity professionals; AI researchers; students in cybersecurity and AI-related fields; law enforcement involved in cybercrime investigations.

Workshop

Tracing and Analyzing Illicit Cryptocurrency Transactions

Thursday 4th Dec. 2025

Presenters

Dr. Shadi Alhakim

Dr Mohammed Shadi is a certified cryptocurrency investigator. He has extensive experience in cybercrimes, digital forensics and cryptocurrency investigations. He has accreditation as a trainer from UNODC and INTERPOL.

Target Audience:

Law enforcement involved in cybercrime investigations and financial investigations, students in cybercrimes and financial crimes related fields.

Workshop

Creative Thinking Skills in Criminal Investigation

Thursday 4th Dec. 2025

Presenters

Dr. Fahad I. Aldosari

Dr. Al-Dosari is a prominent Kuwaiti forensic expert, holding a Ph.D. in Law from the UK and an M.A. in Forensic Science from the USA. He has held the highest administrative positions in the State of Kuwait, including Director General of the General Department of Investigations and the General Department of Criminal Evidence. He specializes in crime scene examination, fire investigation, and explosives, and was instrumental in establishing the DNA Fingerprint Laboratory and enhancing criminal case procedures.

Target Audience:

Law enforcement personnel, forensic professionals, and anyone engaged in criminal inquiry, students attending forensic science programs and academic researcher/lecturer.

Workshop

QA and QC for Fingerprint Labs:
Pathway Towards Accreditation

Thursday 4th Dec. 2025

Presenters

Mr. Akbar Ali

Mr. Akbar Ali, is an experienced and certified latent fingerprint examiner (IAI). He has processed around 20,000 cases relating to latent fingerprint analysis. Mr. Akbar Ali is a trained quality assurance and quality control expert, an international ISO/IEC 17025 technical assessor, and has successfully led the implementation of accreditation standards in forensic science laboratory.

Target Audience:

Latent finger printing experts; criminalists, forensic scientists; students attending forensic programs science.

Workshop

Workplace Drug Testing
Challenges & Quality

Thursday 4th Dec. 2025

Presenters

Dr. Abdul Aziz Aldalgan

Dr. Huda Hassan

Dr Abdul Aziz Aldaglan and Dr Huda Hassan are leading forensic toxicologists in the Kingdom of Saudi Arabia. They have managed forensic toxicology laboratories in large hospitals. They have developed and implemented WDT in their organizations.

Target Audience:

Forensic toxicologists; toxicologists; forensic scientists; students attending forensic science programs.

AJFSFM

Arab Journal of Forensic Sciences and Forensic Medicine

جامعة نايف العربية للعلوم الأمنية
NAIF ARAB UNIVERSITY FOR SECURITY SCIENCES
Est. 1978

Call for Papers

Volume 8, Issue 1, June 2026

Submission Deadline: 1st May 2026

The Arab Journal of Forensic Sciences and Forensic Medicine (AJFSFM) welcomes the submission of scientific articles in all disciplines of forensic science and forensic medicine. AJFSFM is an open access (CC BY-NC), double blind peer-reviewed and free of charge journal devoted to the development and application of forensic sciences and forensic medicine knowledge and research for the purpose of law and justice across the globe. The AJFSFM is an official biannual publication (ISSN 1658-6786) of Naif Arab University for Security Sciences (NAUSS).

Articles are accepted in both Arabic or English languages. Authors are requested to follow Authors' guidelines, and can submit their manuscripts online (https://journals.nauss.edu.sa/index.php/ajfsfm).

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AJSS

ARAB JOURNAL FOR SECURITY STUDIES

جامعة نايف العربية للعلوم الأمنية
NAIF ARAB UNIVERSITY FOR SECURITY SCIENCES
تأسست ١٩٧٨ Est. 1978

Call for Papers

Volume 42, Issue 1, June 2026

Submission Deadline: 1st May 2026

The Arab Journal for Security Studies (AJSS) welcomes the submission of scientific articles in all disciplines emphasizing domestic, international, and global security. AJSS is double blind peer-reviewed, open access (CC BY-NC), free of charge journal devoted to the development of security research and studies, their applications, and related topics. The AJSS is an official biannual academic publication (ISSN: 1319-1241) of Naif Arab University for Security Sciences.

Articles are accepted in both Arabic or English languages. Authors are requested to follow Authors' guidelines published on the journal website, and can submit their manuscripts online (https://journals.nauss.edu.sa/index.php/ajss).

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JISCR

Journal of INFORMATION SECURITY AND CYBERCRIMES RESEARCH

جامعة نايف العربية للعلوم الأمنية
NAIF ARAB UNIVERSITY FOR SECURITY SCIENCES
تأسست ١٩٧٨ Est. 1978

Call for Papers

Volume 9, Issue 1, June 2026

Submission Deadline: 1st May 2026

The Journal of Information Security and Cybercrimes Research (JISCR) welcomes the submission of academic articles in all disciplines of information security and cybercrimes research. JISCR is double blind peer-reviewed, open access (CC BY-NC), free of charge journal devoted to developing information security sciences, cybercrimes, their applications, and related topics. The JISCR is an official biannual academic publication (ISSN: 1658-7782) of Naif Arab University for Security Sciences.

Articles are accepted in English language. Authors are requested to follow Authors' guidelines published on the journal website, and can submit their manuscripts online (**https://journals.nauss.edu.sa/index.php/JISCR**).

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