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ABSTRACT BOOK

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Angelica Giordano

School of Medicine, Università degli Studi di Torino, Italy

Histological Estimation of the Post-Mortem Interval (PMI): Comparative Analysis of Tissue Degradation in Pig Organs at Controlled Temperatures

Abstract

Accurate estimation of the post-mortem interval (PMI) is a longstanding challenge in forensic science. Traditional methods based on entomology or biochemical markers are limited by environmental factors, accessibility, and cost. This study investigates the potential of histological analysis as a practical and low-cost method for PMI estimation. Using pig (Sus scrofa domesticus) tissue as an analogue for human decomposition, organ samples (heart, liver, and lung) were stored under three temperature conditions (4°C, 13°C, and room temperature) and analyzed over four weeks. Haematoxylin and Eosin (H&E) and Periodic Acid–Schiff (PAS) staining were employed to assess tissue degradation, cellular morphology, and glycogen depletion. Results demonstrated a clear temperature-dependent degradation pattern, with slower autolytic and structural changes at lower temperatures. The heart showed the greatest histological resistance, while the lung degraded most rapidly. These findings support the applicability of histological markers for PMI estimation, particularly in laboratory or mortuary settings where molecular resources are unavailable. The study underscores histology's value as an accessible diagnostic adjunct in forensic pathology and lays the groundwork for future quantitative and immunohistochemical research.

Biography

Angelica Giordano is a medical student at the Università degli Studi di Torino and a graduate of the University of Greenwich, where she completed a BSc (Hons) in Forensic Science with First-Class Honours and received the Chartered Society of Forensic Sciences Award for Best Overall Forensic Science Student. Her undergraduate dissertation, which forms the basis of this presentation, focused on histological methods for post-mortem interval estimation. She has experience working as a mortuary technician at the East London Forensic Centre and has volunteered as a cold case investigator with Locate International. Her research interests include forensic pathology, histology, and the intersection of biomedical science and criminal investigation.

Athar Ali Shah

School of Sociology, Guizhou Minzu University, Guiyang, China

Son Preference and Third-Birth Interval Comparative Analysis of Polygynous Versus Monogamous Families in Pakistan

Abstract

Son preference remains a deeply rooted sociocultural phenomenon in Pakistan and plays a critical role in shaping fertility behavior. The study investigates the influence of son preference on fertility behavior, with a specific focus on birth inter- vals and the sex composition of existing children, within the context of marital structure (monogamous vs. polygynous unions) in Pakistan.

Method: Using nationally representative data from the Pakistan Demographic and Health Survey (2012–2013 and 2017–2018), data are analyzed using Cox proportional hazards regression to assess the timing of subsequent births at parity three and linear regression to measure son preference. The sample size included 100733 women of reproductive age (15–49 years), of whom 96975 were in monogamous unions and 3758 were in polygynous unions.

Results: The results demonstrate a persistent and significant son preference in fertility decisions. Women with fewer or no sons are more likely to proceed to another birth, as evidenced by shorter birth intervals. A key finding is that polygynous marriages are associated with both higher son preference and shorter birth intervals compared to monogamous unions. While rural po- lygynous women exhibit stronger son preference, urban polygynous women tend to have quicker transitions to the next birth. In contrast, monogamous women generally report longer birth intervals and lower levels of son preference, regardless of residence.

Catherine Beer

Alliant International University, San Diego, USA

Juvenile Justice on Trial: Public Attitudes, Bias, and the Influence of Race and Academic Achievement in Life Without Parole Sentencing

Abstract

The sentencing of juveniles to life without the possibility of parole (JLWOP) remains one of the most severe and ethically consequential practices in modern justice systems. The United States—standing alone among democratic nations in imposing this sentence on individuals under 18—continues to grapple with the moral, psychological, and systemic implications of this practice. Despite landmark Supreme Court rulings recognizing adolescents' diminished culpability and capacity for change, JLWOP persists in several states, reflecting not only legal discretion but also deeply rooted public and juror attitudes. This research investigates the psychological and ideological mechanisms underlying support for JLWOP across two studies designed to model real-world sentencing cognition. A national survey of jury-eligible participants examined how political beliefs, religiosity, empathy, and views on justice and punishment shaped support for juvenile life without parole, using newly developed measures that captured attitudes toward juvenile maturity, theories of criminal sanction, and perceptions of mitigating or aggravating factors. A second experimental study used a video-based juvenile homicide trial vignette to explore how defendant characteristics—race and academic achievement—interact with participants' preexisting sentencing beliefs to shape verdicts. Across both studies, results revealed that sentencing attitudes are driven more by ideological worldviews and implicit beliefs about culpability and redemption than by case-specific details or overt bias. Participants with stronger punitive ideologies consistently favored harsher sentences, underscoring the powerful role of cognitive schemas in legal decision-making. This effect was more pronounced for White defendants, suggesting racial bias may function

more implicitly. By bridging forensic psychology, developmental science, and human rights frameworks, this research offers actionable insights for legal practitioners, policymakers, and forensic educators worldwide. Integrating structured decision-making tools, judicial training, and culturally informed public education can help align sentencing practices with international standards of fairness, dignity, and developmental justice—advancing a more humane and evidence-based global approach to juvenile sentencing.

Biography

Catherine Beer, Ph.D., is a clinical psychologist and postdoctoral resident at the San Diego VA and the University of California, San Diego School of Medicine. She provides evidence-based care for Veterans in a residential program addressing co-occurring PTSD and substance use disorders, and conducts clinical research on ketamine-assisted psychotherapy within the Neuromodulation Clinic. Dr. Beer earned her doctorate in Clinical Psychology from Alliant International University, where her research examined ideological and cognitive factors influencing public attitudes toward juvenile life without parole sentencing. Her interdisciplinary interests bridge forensic psychology, juvenile justice reform, and psychedelic-assisted therapies—areas she seeks to integrate in pursuit of a more compassionate, evidence-informed approach to justice and healing.

Claudia Focardi

Istituto Zooprofilattico Sperimentale delle Regioni Lazio e Toscana, Florence, Italy

Determination of Toxicants in Baits and Animal Organs in Suspected Poisoning Cases Using GC–MS and LC-MS/MS: a review of 20 years' experience

Abstract

This study reviews 20 years of experience in the determination of toxicants in baits and animal organs in the Lazio and Tuscany regions of Italy. The aim was to identify the principal substances involved in poisoning cases. Based on these findings, we developed a method capable of screening numerous potential toxic compounds with minimal analysis in baits and tissues. A systematic toxicological analysis (STA) combining targeted identification with general unknown screening was implemented. Toxicants were extracted from biological matrices using a QuEChERS-like technique, and instrumental analysis was performed using both GC-MS and LC-MS/MS. The method was validated as qualitative screening and a target list of 42 toxicants was selected to demonstrate the reliability of the results. Retrospective data are also shown, demonstrating that there are many substances involved in poisoning cases, of which metaldehyde rodenticides was found as the most common lethal toxin used during the years.

Biography

She a Master's Level Degree in Chemistry with a post graduate Diploma in Optics and one in Analytical Chemistry. She is the head of the 'Veterinary Chemical Toxicology and Food Chemical Control' laboratory at the Istituto Zooprofilattico Sperimentale del Lazio e Toscana (IZSLT), a public health control institution. She has Published about 18 papers in toxicology and food safety fields.

Dr. Debashis Das

Dr. Sudhir Chandra Sur Institute of Technology and Sprots Complex, West Bengal, India

Fingerprint Biometric:Beyond User Authentication

Abstract

In the digital era, most of our personal information are mutually shared and transferred over the vulnerable digital transmission channel. Hence, there needs a highly secure environment to protect the data from a massive misuse. The biometric-based person identification and authentication are very much popular to achieve such data protection in various sectors like – i) Security and access control, ii) Law enforcement & forensics, iii) Banking & finance, iv) Healthcare, v)Mobile & Consumerelectronics, vi) Government & Civil services, vii) Workforce management. Fingerprint biometric, amongst all other biometric traits, gains a large popularity due to its easy implementation, cost effectiveness and some other intrinsic properties. Therefore, an exhaustive research works have been carried out to make fingerprint-based biometric data protection system much more stronger in handling – security threats, liveness detection to protect spoofing, bio- cryptosystem, latent fingerprint analysis for criminal identification. However, few areas are still proved as very challenging and undiscovered where rigorous research focus is required such as –
(a) Feature analysis from low quality latent fingerprint in criminal identification, (b) Powerful biometric authentication system design for infants along with astrong database construction, (c) Possibility of paternity testing from parent and offspring fingerprint analysis.

Biography

Dr. Debashis Das has received his PhD degree from the department of Computer Science & Engineering, Indian Institute of Technology (Indian School of Mines), Dhanbad in 2017. At present he is working as an Associate Professor in the department of Computer Science & Engineering at Dr. Sudhir Chandra Sur Institute of Technology & Sports Complex, West Bengal, India. His research interest is in Image Processing, Image Steganography and Biometric Authentication. He has published 31 research articles in several conferences and journals of international repute. He has served as a reviewer, technical committee member of different reputed journals and conferences in India and abroad. He has completed one Government funded project sponsored by Defence Research & Development Organization, India. He is the life member of Indian Society of Technical Education) and member of IEEE since 2019. He is also associated with Institutions Innovation Council, Government of India as an Innovation Ambassador.

Professor Dr Dinesh Rao

All India Institute of Medical Sciences, Jammu, India

An Autopsy Study of Homicide and Arson-54 Cases

Abstract

The present prospective study was carried from 2009 to 2012. During this period a Total of 3907 Homicides were Autopsied, of which 54 cases were recorded due to Murder and Arson Incidents, this contributed to 1.38% of Homicides cases. Majority of the Incidents involved Males contributing to 68.52% (n-37) of cases and the Females contributed to 31.48% (n-17) of cases. Maximum number of victims belonged to the age group 31-40 (n-20). The least affected Victims were in 1st and the 6th decade. Majority of Murders, 90.74% (n-49), were as a results of Gunshot wounds and the least type of deaths were due to Stab wounds (1.85%; n-01) and Chop wounds (7.41%; n-04). The commonest method adopted for Arson was placing the Victim in the Car and setting Fire, This was reported in 68.51% (n-37) of cases. This was followed by arson on House of the Victim in 25.93% (n-14) of cases. The least type of Method of Arson adopted were placing(Killing) the Victim in Bush in 1.85% (n-01) and Shop(business) in 3.70% (n-02) of cases and setting on Fire. Gang related Murder and Arson contributed to 64.81% (n-35) of cases. The other commonly reported cases were Sex related factors contributing to 12.96% (n-07) of the cases. The least Motivating factor was Jealousy, recorded in only 05.56% (n-03) of cases. Keywords: Fire; Gunshot; Chop Wound; Stab Wound; Carbon Monoxide; Crime Scene; Murder; Concealment; Identity.

Biography

The Author has 27years of Experience in the Field of Forensic Pathology. He has Three Post Graduate Degree in Forensic Medicine and is also a Graduate in Law. He had Worked as Director & Chief Forensic Pathologist, Jamaica. He had undergone Post Doctoral Training in Forensic Pathology at Edinburgh Medical School Scotland,UK.Presently he is working as Professor & HOD,Forensic Medicine at AIIMS,Jammu,India.

Enas Fawzi Khairullah

King Abdulaziz University, Jeddah, Saudi Arabia

Web Browser Forensics: Tools, Techniques, and Case Studies for Investigating Digital Traces

Abstract

Web browser forensics is a critical area within digital forensics, facilitating the identification, collection, and analysis of digital artifacts generated by browser activities. This research evaluates the effectiveness of forensic tools in analyzing web browser data and their role in investigations. By examining tools such as Autopsy, Browser History Examiner, and NetAnalysis, the study ex-plores their capabilities, advantages, and limitations in extracting and interpreting artifacts like browsing history, cookies, and cache. Two tools are applied across two investigative scenarios: analyzing online activities related to a mass shooting and investigating violations of acceptable use policies. The findings underscore the importance of selecting appropriate tools to ensure accurate evidence collection and compliance with legal and policy requirements.

Biography

Dr. Enas Khairullah is an Assossiate Professor of Computer Science at King Abdulaziz University, Jeddah, Saudi Arabia. She holds two M.S and a PhD in Computer Science. She is also Huawei certified in HCIA-Storage. She earned a six-sigma yellow belt from the American Society for Quality (ASQ). Her main area of interest is dynamic spectrum access networks, wireless networks, resource allocation, scheduling, routing, cognitive radio, auctions, and conflict graph. Her publication record includes scholarly papers in some of the most prestigious peer-reviewed journals in these fields. Dr.Khairullah was awarded several local/international programming competitions awards, and a KAU distinguished researcher award.

Hava Dayan (PhD, LLB)

School of Criminology, , University of Haifa

Homicide Crimes Scene Staging: Forensic Challenges in Prosecution

Abstract

Homicide crime scene staging refers to the deliberate manipulation or alteration of a death scene with the intent to mislead investigators and obstruct the criminal justice process. By concealing the true nature of a crime—often transforming a homicide to appear as an accident, suicide, or natural death—offenders aim to evade detection and accountability. This behavior represents one of the most perplexing and intriguing facets of homicidal offending, yet it remains among the least systematically studied phenomena in forensic and criminological research. The implications of crime scene staging are profound. It can significantly hinder society's ability to accurately identify and classify homicides, leading to unsolved cases, wrongful conclusions, and miscarriages of justice. The deliberate misrepresentation of a crime scene introduces complex barriers for investigators and prosecutors alike, particularly when crucial physical evidence is altered, destroyed, or obscured. This presentation draws upon findings from an empirical study of 56 documented staging cases in the Israel between 1980 and 2019. It seeks to illuminate the unique criminolegal challenges associated with staged homicides, including the reliance on circumstantial evidence, the high threshold of proving guilt "beyond a reasonable doubt," and the loss or degradation of evidence due to both the act of staging and investigative shortcomings.

Katie Weiss

Texas Tech University

The Murder Weapon or A Murder Weapon? Definite Expressions in 911 Homicide Calls

Abstract

The genre of 911 homicide calls is linguistically fascinating. The high stress experienced by the callers compared to the seemingly laid-back yet formal nature of their interlocutors, the 911 dispatchers, cause linguistically complicated discourse. Additionally, many individuals who call 911 are desperately reporting the injury, death, or danger of a loved one, which often causes their emotions to seep through their language use. In this presentation, I will specifically analyze the definite and indefinite expressions used in homicide calls from murders committed in Lubbock, Texas between 2020 and 2023. This paper is part of a larger dissertation project entitled, The Guilty Caller: A Corpus Linguistic Analysis of Guilty versus Innocent Callers in 911 Homicide Cases. The purpose of this specific paper is not to analyze the use of definite expressions between innocent versus guilty callers between two large corpora, but to analyze three of the phone calls I have collected from Lubbock, Texas in which the callers and/ or the dispatchers use definite expressions to refer to the murder weapon involved in the case, the victim of the murder, or the suspect.

Biography

Katie Weiss is currently studying Linguistics through the English department at Texas Tech University. She received her M.A. in Applied Linguistics at Texas Tech in May 2022, and she will receive her Ph.D. in May 2027. Her dissertation focuses on the language use of 911 callers related to homicide cases in Lubbock, Texas and San Angelo, Texas, specifically related to the emotions these callers experience during the phone calls as explictly represented by their language use.

Jayeshkumar Kanani, Kunjan Modi

Surat Municipal Institute of Medical Education and Research, Surat, India

Ruptured Saccular Descending Thoracic Aortic Aneurysm with Dissection

Abstract

Descending thoracic aortic aneurysms (DTAAs) are often asymptomatic and underdiagnosed, with rupture being a catastrophic event. Saccular aneurysms, a less common morphological variant, may carry a higher risk of rupture compared to fusiform types. We report a case of a 56-year-old male with a history of hypertension and diabetes mellitus, who experienced sudden collapse and was declared dead on arrival. Autopsy revealed 2750 grams of blood in the left pleural cavity and a 2.5 cm transverse tear in a saccular aneurysm of the descending thoracic aorta, accompanied by aortic dissection. Histopathological examination showed necrosis, fibrosis, and a mixed inflammatory infiltrate at the rupture site, along with features of healed myocardial infarction and grade VII atherosclerosis. This case underscores the silent yet fatal nature of saccular DTAAs, particularly in patients with risk factors like hypertension and diabetes. The findings highlight the importance of considering aortic aneurysm rupture in sudden unexplained deaths and the value of thorough autopsy examinations in such cases. Early detection and management of DTAAs, especially the saccular type, are crucial to prevent sudden death. Regular monitoring in high-risk individuals and awareness of this potential diagnosis can aid in timely intervention.

Biography

Dr. Jayeshkumar Kanani has over 14 years of experience including 8 years of experience in the field of forensic medicine and Toxicology. Appointed in 2016 as an autopsy medical officer, he has conducted over 4,000 autopsies, providing invaluable medico-legal expertise in death investigations. His expertise extends to histopathological studies, scientific writing, court testimonies, and mentoring students in forensic medicine.

Dr. Kanani has published eight peer-reviewed papers in international journals such as Elsevier, BMC, and SpringerNature, with seven as the first author. He has demonstrated exceptional skill in managing the publication process, and successfully publishing articles with tight deadlines.

His research interests include general medicine, forensic medicine, Toxicology, Surgery, Cardiology, Pathology, Oncology, and Neurology. He is passionate about contributing to the academic and professional community and welcomes opportunities to collaborate on research and editorial endeavours.

Mohammad Haddadi

King Fahd Security College, Riyadh 13232, Saudi Arabia

Impact of Ballistic Evidence on Criminal Investigations in Selected Middle East Countries

Abstract

Ballistic evidence plays an important role in modern criminal investigations. Its ability to link projectiles and firearms to perpetrators and crime scenes leads to a more effective justice system. However, despite the technological and economic development today, most countries still struggle to implement this process or run it effectively, especially in the Middle East. This paper focuses on four Middle Eastern countries, Turkey, United Arab Emirates (UAE), Kingdom of Saudi Arabia (KSA), and Jordan, assessing their current use and subsequent impacts of forensic ballistics. The goal is to outline each country's forensic infrastructure, legal frameworks, and challenges in ballistic evidence collection, analysis, and admissibility. The study finds that although forensic capacities vary considerably, fueled mainly by each country's economic progress, regional collaboration and the use of technology have helped strengthen ballistic investigations, subsequently improving prosecution rates and reinforcing judicial confidence. Key challenges include resource disparities, standardization of protocols, and training deficits. Recommendations emphasize harmonized procedures, investment in advanced imaging systems, and capacity-building initiatives to optimize ballistic evidence utilization.

Biography

Mohammad Ali Haddadi is a dedicated PhD student in Criminal at King Saud University in Riyadh, prior to their doctoral studies, I earned a Master Degree in Crimnology from Saint Joseph University in USA, where they investigated challenges that faces countries which have low-resource settings, in collecting and analyzing ballistic evidence.

Teaching experience: I have served as a teaching for forensic scince in King Fahd Security College and collaborated with Firearms labs in poice departments

NITIN SONI

Sobhasaria Group of Institution, Gokulpura, NH-52, Ramuka Bas, Sikar 332021

A Multidisciplinary Approach to Cybercrime: Enhancing Investigations through Cybersecurity and Digital Forensics Integration

Abstract

In the digital era, cybercrime has evolved into a sophisticated and persistent threat, targeting individuals, organizations, and even nations. As cybercriminals leverage advanced techniques to breach security systems, the need for an integrated approach combining cybersecurity and digital forensics has become more critical than ever. While cybersecurity focuses on preventing, detecting, and mitigating cyber threats, digital forensics plays a vital role in investigating incidents, tracing attackers, and gathering evidence for legal proceedings. This paper explores the synergistic relationship between these two fields and how their convergence enhances cybercrime investigations.

A holistic approach to cybersecurity and digital forensics involves real-time threat intelligence, proactive security mechanisms, and forensic methodologies that enable investigators to reconstruct cyber incidents accurately. Traditional cybersecurity strategies primarily emphasize network defense, encryption, and vulnerability management, whereas digital forensics delves into post-incident analysis, extracting and preserving digital evidence from compromised systems, networks, and storage devices. Bridging the gap between these disciplines ensures a more comprehensive strategy for tackling cybercrime, reducing response time, and improving threat attribution.

With the rise of AI-driven cyberattacks, ransomware, and deepfake technology, cybercriminals continuously adapt to security measures, making it challenging for organizations to stay ahead. This study highlights the importance of integrating artificial intelligence (AI) and machine learning (ML) in cybersecurity and forensics to automate threat detection, enhance digital evidence analysis, and streamline incident response. Advanced forensic techniques, such

as memory forensics, blockchain-based evidence verification, and forensic automation, are examined for their role in strengthening investigations.

Furthermore, the legal and ethical aspects of cybercrime investigations are discussed, emphasizing the need for standardized forensic procedures, international cooperation, and regulatory frameworks to ensure digital evidence integrity and admissibility in court. The paper also explores challenges such as encrypted communications, anti-forensic techniques used by cybercriminals, and jurisdictional complexities in cross-border cybercrime cases.

By adopting a multidisciplinary approach that blends cybersecurity, digital forensics, law enforcement, and AI-driven analytics, organizations can build robust defense mechanisms and enhance cyber resilience. This research contributes to the growing body of knowledge on cybercrime investigations and provides actionable insights for security professionals, forensic experts, and policymakers to bridge the gap between cybersecurity and digital forensics effectively.

Biography

Mr. Nitin Soni is an Assistant Professor of Computer Applications with over 8 years of academic experience and 3 years in the PHP Web Development sector. He is currently pursuing his Ph.D. in Cyber Security from Government Engineering College, Bikaner.His research interests include cybersecurity, AI-driven digital forensics, open-source intelligence (OSINT), and web development.

Mr. Soni has actively contributed to academia through teaching and project supervision & training. He is a recognized Cyber Volunteer under the Ministry of Home Affairs' I4C Program. Passionate about bridging theoretical knowledge with real-world case solution of cyber security. He has presented and published 20+ research papers in international conferences and reputed journals, particularly focusing on cybercrime, AI, and privacy and attended 17+ workshop and FDP from reputed organizations and institutions. With a flair for digital education, he also runs an educational YouTube channel, DigiSikshak, to simplify complex tech topics for learners

Prof. Penny Woolnough

Kydd Building, Abertay University, Dundee DD1 1HG

Distinguishing suicides of persons reported missing to police from those not reported missing

Abstract

Some suicides are reported as missing persons to the police while others are not. Understanding what distinguishes these groups may inform our knowledge of suicide and may have preventative/operational utility of the investigation of missing persons and the identiication of suspicious missing person cases. This study compared suicides by persons reported missing to police in Scotland with suicides not reported missing in order to assess whether specific epidemiological, sociodemographic or circumstantial characteristics distinguish these groups. Scottish Police Death Reports collected from a police force in the North-East of Scotland were content analysed for a sample of 160 suicides/undetermined deaths occurring over a 3 year period. Results indicate that suicides reported missing were more likely to be older but did not differ from other suicides on any other epidemiological or sociodemographic characteristics. Non-missing suicides were more likely to be found inadvertently by people within their social or daily living network. In contrast, missing suicides were more likely to be located in natural outdoor locations by police/searchers or members of the public and took longer to find. It is concluded, therefore, that suicides which begin as missing person investigations do not differ from other suicides on epidemiological or sociodemographic characteristics, but do manifest differences in terms of a complex interplay of factors associated with those left behind and their location.

Biography

I am Professor of Forensic and Investigative Psychology and Associate Director of the Scottish Institute for Policing Research with specific responsibility for the Evidence and Investigation Network. With a former police officer colleague I pioneered the development of behavioural profiling of missing persons and my research findings are used by all UK police forces, Search and Rescue Teams, HM Coastguard and allied international agencies. As an HCPC Registered Forensic Psychologist I have provided expert advice/operational support to over 100 high profile missing person cases around the world. Before joining Abertay, I spent 14 years as Senior Research Officer and Head of the Grampian Police Research Unit (now Police Scotland). Working directly with the police I have cultivated my own research interests predominantly within the remits of forensic and investigative psychology.

Sreelakshmi Krishna

National Forensic Sciences University, India

Trajectory- the unseen realm in a firing event: a novel and scientific approach in the identification of optimal recovery zones for gunshot residue micro traces

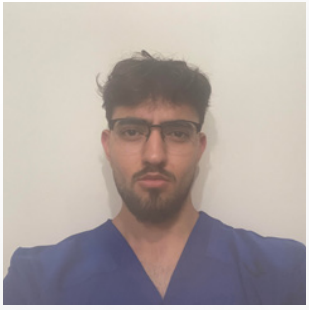
Abstract

Gunshot residue (GSR) particles, generated during firearm discharge, disperse in the surrounding environment according to physical laws governing the motion of particles. This study analyzes GSR distribution from 9 × 19 mm ammunition along the trajectory with a fixed target. GSR particle count follows a bell-shaped distribution, influenced by velocity, temperature, and burn rate. Understanding this pattern aids in modeling GSR dispersion based on muzzle-to-target distance, improving forensic analysis of shooting incidents. The kinematic behavior of GSR particles observed in this study facilitated the identification of the region exhibiting the highest deposition. The peak particle deposition was detected along the projectile trajectory, specifically at 100–130 cm from the muzzle end, in the direction of fire. This facilitated the identification of the distance at which the probability of obtaining maximum GSR particles is possible. This aids forensic investigations, providing insights into the trajectory, and identifying the potential region of maximum GSR deposition. A significant influence of distance on the number of GSR particle deposition was observed in the study. The study highlights the necessity of GSR collection along the trajectory, where retrieval probability is higher than at the muzzle or target. A methodology using the Trasoscan Laboratory Imaging System (TLIS) for GSR detection and counting is proposed. TLIS demonstrates potential as a primary imaging tool, with analytical data represented as particle frequency in the shooting vicinity. SEM analysis reveals significant deviations in GSR size distribution across muzzle, trajectory, and target, enhancing accuracy by identifying GSR-dense areas for more precise forensic conclusions.

The largest GSR particles were recovered from the target distance (470–500 cm), suggesting surface modifications upon impact, which can be instrumental in estimating the shooting distance. The proposed approach could be implemented in current analytical pipelines or caseworks.

Biography

Ms. Sreelakshmi Krishna is a Research Scholar at the National Forensic Sciences University, an Institute of National Importance under the Ministry of Home Affairs, India. She is pursuing research in Forensic Physics, focusing on Gunshot Residue (GSR) analysis and thin film deposition techniques such as spray pyrolysis. Her interdisciplinary work combines forensic physics and material science to enhance the accuracy of forensic methodologies. In 2019, she worked as an Assistant Professor at PM Thevar College, Madurai, in the Department of Forensic Science. She has published three research papers, one review article, and a book chapter. Her contributions to forensic research have earned her several accolades, including the Best Young Women Scientist Award (2023) at the 5th International Conference on Forensic Research and Toxicology in Singapore, the Best Young Researcher Award (July 2024), and the Best Shotgun Poster Prize at the 4th International Caparica Conference in Translational Forensics (October 2024).



Yousef H. Hindi

New Vision University, Faculty of Medicine, Tbilisi, Georgia

Enhancing Forensic Blood Spatter Education through Simulation-Based Approaches

Abstract

Blood spatter pattern analysis (BPA) is critical in criminal investigations, but traditional teaching methods limit opportunities for hands-on learning and skill development. Artificial intelligence (AI) offers possibilities to improve tools and expand practical training opportunities for forensic students. This study aims to examine the effectiveness and potential of AI simulations in forensic blood spatter education.

From a perspective standpoint, integrating simulation-based approaches into BPA education could provide students with interactive and controlled opportunities to explore blood spatter patterns. By allowing learners to adjust variables such as angle, force, and surface type, these approaches can help refine analytical skills and deepen understanding of spatter principles. Interactive simulations also offer repeated practice in a safe environment, complementing traditional hands-on exercises and exposing students to a wider variety of scenarios than might otherwise be feasible.

These innovations have the potential to enhance critical thinking, problem-solving, and confidence in analyzing blood spatter. They can also support flexible learning, including remote or self-directed practice, making high-quality forensic education more accessible and engaging for a broader range of students.

In conclusion, adopting simulation-based strategies in blood spatter education could effectively supplement conventional teaching methods. By providing immersive, repeatable, and controlled learning experiences, these approaches may better prepare students for practical forensic work and contribute to the ongoing development of forensic training. Further exploration will be valuable to determine how best to implement these strategies for maximum educational impact
.

Biography

Yousef Hindi is a 3rd-year MD student at the Faculty of Medicine, New Vision University, Tbilisi, Georgia, where he has received a scholarship for academic excellence. His primary interests lie in forensic medicine and the application of artificial intelligence in medical education and practice. He has completed a clinical rotation and actively volunteers with the Dandy Neurosurgical Club, contributing to educational and community initiatives. Yousef is dedicated to advancing innovative approaches in medical training and exploring the integration of technology to enhance learning and patient care.

Zhenwen Sun

Institute of Forensic Science, Ministry of Public Security, Beijing 100038, China

Triacetone Triperoxide (TATP) Transformation: Mechanistic Insights into the Acid-Promoted Conversion to Diacetone Diperoxide (DADP)

Abstract

As a poorly stable peroxide explosive that was first reported in 1895 by Wolffenstein, triacetone triperoxide (TATP) is one of the most frequently improvised peroxide explosive encountered in criminal and terrorist activities due to its ease of manufacture and the availability of the precursor compounds. TATP is always prepared by reaction of acetone with hydrogen peroxide in an acidic environment. The one-pot synthesis from readily available precursors can produce TATP in high yield. Previously reported results indicate that acid type, catalyst type, reactant concentration, and reaction temperature affect the TATP synthesized. The identification of the acid used for TATP synthesis can help criminal investigators in discovering the identity of TATP producers.

Previously reported results indicate that TATP synthesized by different processes can be transformed into DADP under certain conditions. A thorough understanding of the transformation processes and mechanisms of TATP under conventional storage conditions can provide important theoretical support for forensic investigators in terms of evidence collection, preservation, detection, and traceability of explosive materials and their precursors. Existing studies have indicated that factors such as the type and amount of catalyst, and storage conditions, are the main factors affecting the stability and transformation of TATP to DADP. However, the specific transformation mechanism of TATP to DADP has not been thoroughly explored, and the detailed reaction pathways and mechanisms require further research to be determined.

This study systematically investigates the effects of factors such as the type of residual synthetic catalyst acid, residual acid concentration, and temperature in TATP samples on the transformation of TATP to DADP. The research results show that only TATP samples synthesized with non-volatile, hygroscopic acids (H2SO4, H3PO4, HClO4) underwent rapid conversion to DADP upon mild heating (≥40°C), whereas HCl, HNO3, or recrystallized TATP remained stable. It is speculated that the hygroscopic nature of the residual acid induces the formation of hydrogen bonds between TATP molecules and the residual acid, leading to the cleavage of the TATP cyclic structure and the generation of DADP and acetone. In light of previous research findings, this may represent the fundamental pathway for the transformation of TATP into DADP.

Biography

He has received Doctoral degree of Procedural Law from the People's Public Security University of China in 2014. In 2021, he was appointed as the investigation technical expert of fire related cases by the Criminal Investigation Bureau of Ministry of Public Security. He is the director of the identification management department of Institute of Forensic Science (IFS). He has completed the examination of more than 2000 cases involving explosion, fire and shooting cases, and participated in the crime scene investigation of more than 60 major cases. He has published more than 150 academic papers since 2007. He has been granted 7 national invention patent, 17 utility model patents and 11 computer software copyright registrations.

Zhouxiang Ji

Ministry of Education, Xidian University, Xi'an, Shaanxi, China 710126

Nanopore-based sensing at the single-molecule level

Abstract

Single-molecule nanopore technology has attracted much attention due to its advantages such as long-read sequencing, ultra-high spatiotemporal resolution, real-time detection, and high speed. Herein, we will report three nanopore stories: (1) the construction of semi-synthetic nanopore protein and its long-reading DNA; (2) nanopore-based peptide discrimination with single amino acid resolution; (3) high-throughput biochip for ultralow sensing.

Biography

Ji, Zhouxiang, Ph.D., is a professor at the School of Life Science and Technology, Xidian University. He also serves as the Director of the International Science and Technology Cooperation Base of Xi'an Intelligent Precision Diagnosis and Treatment, and the Director of the Xidian University Comprehensive Experimental Center for Chemistry and Bioscience. He graduated from Dr. Peixuan Guo's lab at the College of Pharmacy of The Ohio State University in May 2019. From September 2019 to December 2012, he worked at BGI Research as the department leader of the nanopore project. His recent research focuses on single-molecule nanopore biosensing, including DNA sequencing and proteomics. He has received several fundings, such as the National Natural Science Foundation of China, the Qin Chuangyuan Program, the National Key Research and Development Program, and others.

Karim Allaw

Lebanese University, Lebanon

Soil Contamination from Military Activities in South Lebanon: Forensic Investigation

Abstract

Armed conflicts leave long-term environmental legacies, particularly in soils exposed to explosives, heavy metals, and chemical pollutants. South Lebanon, repeatedly affected by warfare, represents a critical case where agricultural lands are threatened by contamination from military residues. Despite existing reports of environmental degradation, limited systematic forensic investigations have been conducted on post-conflict soils in this region.

This research addresses the gap by assessing the quality of agricultural soils in southern Lebanon following the 2006 war and subsequent military activities in this conflict war zone. The objectives are to (1) quantify heavy metals, explosive residues, and organic pollutants in contaminated soils, (2) characterize their spatial distribution and potential human health risks, and (3) evaluate forensic and remediation approaches to mitigate their long-term effects.

Methodologically, soil samples will be analyzed using ICP-MS for heavy metals, GC-MS and GC-ECD for nitroaromatic explosives, and spectroscopic methods (FTIR, Raman) for structural characterization. Complementary microbiological analyses (16S rRNA sequencing, metagenomics) will assess impacts on microbial diversity and potential bioremediation strategies, including chelation and microbial degradation pathways.

The study is expected to contribute to forensic environmental science by establishing a robust database on conflict-related soil contamination in Lebanon. Beyond advancing scientific knowledge, the findings will provide policy-relevant insights into risk assessment, agricultural safety, and post-conflict recovery strategies for contaminated lands.

Kyriacos Evangelou

School of Medicine, National and Kapodistrian University of Athens, 11527, Greece

Assessing the accuracy, readability, legal coherence, and educational value of ChatGPT-generated answers to 15 basic forensic medicine questions using reviewed structured analysis and readability metrics

Abstract

The intersection of forensic medicine and artificial intelligence (AI) presents new opportunities for public education, especially as AI tools increasingly mediate health and legal information access. This study aimed to evaluate the accuracy, readability, clarity, and educational value of ChatGPT- generated responses to 15 frequently asked forensic questions reflecting both public curiosity and courtroom relevance. Fifteen core questions representing key medico-legal concepts submitted to ChatGPT-4 with no instruction to simplify, filter, or tailor outputs. Answers were evaluated through a simulated peer-review process involving four reviewers, each independently rating responses for scientific accuracy, forensic appropriateness, clarity, terminology use, legal framing, and lay audience accessibility. Standard readability indices were applied: Flesch Reading Ease, SMOG Index, Coleman–Liau Index, and FORCAST Grade Level. Reviewers also assessed structural formatting and narrative flow as variables affecting public comprehension. All responses demonstrated high factual accuracy, with all reviewers affirming 100% alignment with contemporary forensic science and medico-legal practice. The Average Flesch Reading Ease score was 53.5 (range: 46.8–59.4), while SMOG, Coleman–Liau, and FORCAST scores averaged 10.8, 11.2, and 10.4, respectively, indicating a consistent U.S. Grade 10-11 readability level. Approximately 73.3% of responses were deemed clearly accessible to the general public; the remaining 26.7%, while moderately complex, maintained clarity through bulleted formatting, consistent terminology, and logical progression. Questions 3 (difference between cause, manner, and mechanism of death) and 10 (signs of

strangulation) were the highest-rated for educational structure; Question 7 (what happens during a forensic rape kit examination) stood out for its ethical tone and clinical sensitivity. No critical inaccuracies or misleading content were identified in any entry. ChatGPT seems to consistently deliver accurate, pedagogically sound, and legally coherent forensic explanations, representing a promising adjunct in public forensic literacy, courtroom preparedness, science communication, and medico-legal outreach, especially under expert supervision.

Biography

Dr. Kyriacos Evangelou holds an MD with first-class honours from the National and Kapodistrian University of Athens (NKUA). He has published over 20 papers in peer-reviewed journals, co-authored two original research-based book chapters on innovative aspects of robotic-asssited colorectal surgery (NOTES; Natural Orifice Transluminal Endoscopic Surgery, and the world's first AI-assisted AR hemicolectomy with instrument deocclusion), and records more than 100 oral and poster presentations in congresses and conferences. He has completed over 330 hours of online courses on specialized medical topics (e.g., "Research Data Management and Sharing) from world- renowned Universities (e.g, Duke, Yale, Stanford), multiple live surgical workshops and courses (e.g. emergency surgery, laparoscopic surgery, orthopaedic surgery), and received more than 25 prizes and awards in physical sciences, surgery, and neuroanatomy through his lifetime. He intents to complement his expertise with a Law Degree (NKUA) and a Master's Degree on "Forensic Medicine and Forensic Psychiatry" (Aristotle University of Thessaloniki).

Mohammed S. ALrheem

Judicial Expertise and Research Center/ Ministry of justice

New HS-GC/FID and traditional enzymatic methods for Blood alcohol analysis in Myocardial Infarction patients: A comparative study in Libya

Abstract

In a state of Libya, alcohol intake is strictly prohibited by law and the presence of any detectable concentrations is illegal. For those people who suffer myocardial infractions (MI), determination of any detectable blood alcohol concentrations (BAC) is considered crucial, as data will be used evidence in a court of law. The selection of the efficient technique used for alcohol concentration determination is very important and any false results strictly cannot be acceptable when dealing with country laws. In Libya, since long time ago, Lactate dehydrogenase (LDH) enzyme technique has been chosen as the most valuable one used in determination of (BAC) in patients of (MI). However, when LDH concentration significantly exceed the typical levels of 800 IU/L, such technique is not appreciable compared to the recommended Head space-gas chromatography/flame ionization detector (HS-GC/FID) technique, since causes significant and falsely elevated results which may also lead to false convictions.

In this study, the efficiency of the new HS-GC/FID technique and the traditional (LDH) enzyme technique were examined for (BAC) concentrations detections at some hospitals of Tripoli city in Libya state.

Methods: The study targeted 48 individuals, of which half of them were (MI) patients.The obtained data were statistically evaluated using IBM SPSS Version 21 program. Median of data was calculated using descriptive analysis, and comparative analysis between groups was carried out using Mann-Whitney U test.

Results: Differences are considered statistically significant at $p<0.05$. As a result, the (BAC) (mg/dl) data for healthy and (MI) patients statistically showed a significant difference ($p<0.05$) using the (LDH) enzymatic method. Whereas, there were no significant upon using the (HS-GC/FID) technique. Pearson coefficients correlation (R2) of (LDH) levels against (BAC) concentration was 0.76 indicating somewhat strong positive relation, proving that when (LDH) levels in blood increases, the (BAC) concentration also increase.

It is recommended that future studies should concentrate on a large size of samples. Besides, great attentions should be payed to techniques with higher accuracies in results such as (HS-GC/FID) technique, mostly when dealing with forensic analysis.

Yuliia Kuzyk

Danylo Halytsky Lviv National Medical University, Lviv, Ukraine

A Case of Sudden Cardiac Death in a 29-Year-Old Woman with Drug-Induced Cardiomyopathy

Abstract

In cases of sudden death of children and young individuals, postmortem examination of the cardiac conduction system is crucial for determining thanatogenesis and causes of death.
The aim of this work is a pathomorphological analysis of a case of sudden cardiac death in a 29-year-old woman with drug-induced cardiomyopathy.
A forensic medical examination of the corpse of a 29-year-old woman with drug-induced cardiomyopathy was conducted in the forensic medical department of the Main Bureau of the Ministry of Health of Ukraine following the standard method. The histological examination included hematoxylin and eosin, Masson's trichrome staining, and Gomori's silver impregnation.
A 29-year-old woman died suddenly in a rehabilitation center in Kyiv, where she was receiving treatment for drug addiction. Her medical history indicates that she had been using phenibut and diphenhydramine since the age of 18, and methadone since she was 25. A forensic examination revealed that, the heart was rounded and enlarged (weight 450 g, measurement 11.5x12.3x6.7 cm) with hypertrophy of the walls of both the left and right ventricles, and the interventricular septum. The thickness of the right ventricle wall reached 0.6 cm, the left ventricle 1.7 cm, and the interventricular septum 1.4 cm. The ventricular cavities, particularly the right ventricle, were dilated. The tricuspid valve perimeter measured 13.5 cm, the aortic valve 7.4 cm, and the mitral valve 10.5 cm. The myocardium appeared light brown with a cyanotic tint, flaccid, and dull. The coronary arteries were morphologically normal. According to toxicological studies, traces of methadone and diphenhydramine were found in the urine. The histological changes in the myocardial tissue of the left and right ventricles and interventricular septum did not differ significantly. They manifested as hypertrophy and fragmentation of cardiomyocytes, with randomly multidirectional groups of cardiomyocytes and focal fibrosis. Elements of the

cardiac conduction system appeared as focally fibrotic embryonic cardiomyocytes surrounded by proliferating reticular fibers. In the area of the sinoatrial node, alternating foci of atrophied and vacuolated cardiomyocytes were identified, with unevenly located reticular fibers showing hyperchromia and varying thickness.

The sudden cardiac death of a 29-year-old woman can be classified as drug-induced cardiomyopathy, based on her medical history and postmortem toxicology results.

Md. Shakhawat Hossain

Department of Criminology and Police Science, University of Chittagong

Examining the role of Forensic Science in Criminal Investigation: A Criminological Analysis

Abstract

In the contemporary phenomenon Bangladesh has given more importance to identify the culprit on the basis of scientific investigation. Without the knowledge of forensic science the investigation doesn't comes accurately and properly. Criminal investigation is the compulsory job for police and the uses of forensic science helps police to trace out the actual situation of the incidents. This paper mainly explored the major problems of criminal investigation and the scarcity and shortage of knowledge in forensic science. The study is qualitative and based on the primary data gathered from purposively selected in-depth key informant interviews supplemented by secondary analysis. The major problems of criminal investigation identified by the respondents include the limited or unavailability of resources and logistics for investigation, insufficient budget allocation, improper protection of crime scene, tempering of evidence available from the crime scene, shortage of evidence collection, and external interference in investigation. Moreover the shortage of forensic institution, lack of machinery tools and techniques, improper diagnosis of crime scene management, problems of evidence collection and preservation are the major obstacles of forensic science in criminal investigation. The study generated very useful facts that can be helpful for policy measures to improve the quality of investigation by using the knowledge of forensics. The implications for further research are also many given the limitation and scope of this study.

Biography

Md. Shakhawat Hossain is working as a Faculty Member of the Department of Criminology and Police Science at the University of Chittagong, Chittagong, Bangladesh. Previously, Mr Hossain has been performed as Chairman of the Department of Criminology and Police Science. Before that he worked in Police Staff College, Bangladesh (the apex training centre of Bangladesh Police). He also worked in some of the national and international Non-Governmental Organizations (NGOs). Besides teaching, Mr Hossain is writing for national dailies on contemporary and criminological issues. He has attended several national and international conferences on existing issues of the criminological arena. His area of interest is terrorism, political crime, domestic violence, investigation, police and victimization. He has acquired necessary training in qualitative, quantitative, evaluation and spatial research from reputed institutions.

Dr. Shahid Iqbal

Department of Forensic Medicine, Toxicology, Bacha Khan Medical College, Mardan, KPK.

To identify common documentation errors in medico-legal reports (MLRs). And emphasize their significance as essential medical documents in judicial processes

Abstract

A Total of 112 MLRs meeting the inclusion criteria were analyzed. Data from retrospective medico-legal records were reviewed individually, and documentation errors, omissions, and instances of overwriting without authentication were noted using a structured checklist Proforma.

Results: A total of 112 medico-legal reports were included. Of these, 92 (82.14%) were male, and 18 (16.07%) were female. In two cases (1.78%), the dismembered body parts could not be conclusively identified in terms of sex. The majority involved young adults aged 18-35 years, accounting for 57 cases (50.89%). Firearm injuries constituted over 40% of the cases, with 37% related to homicide. More than 80% of traffic accident cases involved motorbikes. All MLRs were prepared using a locally printed proforma. Identification marks were missing in more than 95% of reports. In 98% of cases, the identifiers detailed were partially mentioned. None of the MLRs had an official stamp affixed by the attending physician. The physician's designation was missing in 39 reports, and overwriting was observed in 26.

Conclusion:
The study highlights serious deficiencies in medico-legal documentation, underscoring the need for standardized formats, training workshops, and regular audits to enhance the quality and legal credibility of MLRs in Pakistan.