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Research Article **Published Date:- 2023-12-19**

Forensic Comparison of Textile Fibre for Identification using X-ray Diffraction Technique

This study delves into the forensic examination of textile fibers for identification through the application of the X-ray diffraction (XRD) technique. With the textile industry producing an array of materials, both natural and man-made fibers, the need to distinguish between them for forensic purposes becomes paramount. The primary objective of this research is to identify unique characteristics in fiber samples, differentiating between branded and non-branded company textiles. The focus is placed on fresh, unused cloth fibers obtained directly from shops. The study encompasses two broad categories of fibers: natural (such as cotton, silk, and wool) and man-made (including nylon, rayon, and polyester). Samples from both branded and non-branded textiles undergo analysis using XRD, a sophisticated method capable of revealing the crystallographic structure of materials. Results obtained from the XRD analysis unveil intensity peaks at various levels and degrees, providing distinctive patterns for individualization. Even within the same fiber category, such as polyester and cotton, discernible differences in intensity peaks facilitate the identification process. This research contributes to the advancement of forensic techniques by offering a reliable means of identifying textile fibers. The utilization of XRD not only allows for the differentiation between natural and man-made fibers but also enables discrimination among textiles produced by different companies. The implications of this study extend to forensic investigations, where the ability to precisely identify fibers can provide valuable evidence in criminal cases involving textiles.

Research Article **Published Date:- 2023-12-13**

Automatic Hand Features Extraction for Forensic Purposes

This work describes a low computational cost image processing methodology for the identification of hand features for forensic applications – like height, gender, and ethnicity for suspect inference. The proposed methodology provides an adequately tailored sequence of image and geometrical processings on pictures of hands based on critical points like fingertips, finger valleys, and palm centers. As a result, we present the automatic measurements taken on 416 images compared with actual measurements from a manual caliper. The proposed approach leads to a 93.16% correlation (p - value < 0.05) related to the caliper, demonstrating the effectiveness of the technique.

Case Study **Published Date:- 2023-12-08**

Characteristics of Juvenile Sex Offenders in Poland

According to statistical data in Poland, sexual acts of minors account for about 3% of all criminal acts committed by minors and nearly 20% of all acts from the catalogue of crimes against sexual freedom and morality. The main objective of the study was to attempt to develop and present characteristics of minors who commit rape with particular cruelty. Taking into account the way the perpetrators act, the motivational background, and the circumstances of the crime. In particular, attention was paid to specific individual and family characteristics. Because it is not clear whether juvenile sex offenders are different from non-sex offenders. The aim of this article is an attempt to capture individual, family, and environmental differences. The study was also intended to provide information about who the victims are. The study was conducted on the basis of empirical material from court cases in which the basis of liability was Article 197§4 of the Penal Code, and the perpetrators or accomplices of the acts were minors who at the time of the act were over 15 years of age but under 17 years of age. The research material consisted of court case files that had been finally completed, including forensic psychological opinions prepared by court experts. Cases from 2015-2020 were analysed. The obtained results allowed us to capture some specific features of families in which minors were brought up and the characteristics of juvenile sex offenders themselves. This article raises the difficult issue of juvenile responsibility for sexual crimes and indicates areas in which it is necessary to regulate interactions and areas of possible preventive impacts.

Research Article **Published Date:- 2023-10-17**

Investigation of Malpractice Claims Concerning Orthopedic Surgeons in Sari, North of Iran, 2015-2020

Introduction: Treatment failure and claims against physicians may have many negative consequences. Orthopedic surgeons have always been among the most used specialists. Therefore, the investigation of causes and the process of these claims can help reduce the negative effects of medical malpractice on physicians and society.
Materials and methods: This retrospective study investigated all medical orthopedic negligence cases in Sari, Iran, from March 2015 to March 2020. Data were collected using a researcher-made checklist and analyzed in SPSS software (V-21).
Results: Out of 57 finalized cases investigated in this study, surgeons were found liable in 23 (40%) cases. The mean ± SD age of patients was 41 ± 19.3. Moreover, the level of education had a positive correlation with the surgeon's liability. The most common cause of complaint was reduced Range of motion (ROM) and the most common type of complained surgery was "open reduction & internal fixation" (ORIF). None of the surgeons were found liable due to surgical site infection or device failure. The mean ± SD time for the file processing was 11.1 ± 10.1 months. The mean indemnity payment was 320 million Iranian Rials (9.7% of indemnity for death in Iran).
Conclusion: The most effective way to reduce medical complaint cases is to increase the knowledge and skill levels of physicians. The lack of a blinded arbitration system in both organizations could lead to bias in the case assessment process. Moreover, considering the long processing time of the claims, it is recommended that new technologies should be used to reduce the time and increase the accuracy of the final verdict. The absence of a 'no-fault' compensation program is a significant flaw in Iran violating patients' rights. Also, more studies are needed to evaluate justice and equality in Iranian medical commissions.

Short Communication **Published Date:- 2023-10-04**

Augmented and Virtual Reality in Forensic Odontology: Practical Implementations

Forensic odontology's evolution from manual to digital methods signifies a pivotal transition. Augmented Reality (AR) and Virtual Reality (VR) further this transformation by merging the physical and digital realms. This brief communication explores how AR and VR can enhance forensic odontology, offering precision, interactivity, and advanced analysis. It delves into the current landscape and envisions future possibilities, emphasizing their role in shaping precise and collaborative forensic practices. Additionally, challenges and considerations for implementing AR and VR in this field are discussed.

Literature Review **Published Date:- 2023-09-25**

The Effectiveness of Chromotherapy on Youth

The majority of people view color therapy as an alternative therapy. It is a rather young field of study. There are a tonne of various elements in life that might affect your mood and mental health. It is proposed that colors and colored lighting can improve one's physical or mental health. If you want to create a calm and clear workplace, it's critical to understand how color influences your mood. The interaction between the human body and colors has been thoroughly explored in a variety of research. Despite the fact that color therapy has been used for thousands of years, people's interest in it has grown more recently. Different body parts are related to different colors. These are the various energy centers' inherent healing abilities. In today's age of globalization, color therapy is one of the most well-liked complementary treatments used to affect people's conduct and brains. In forensic psychology, color is a crucial element that helps to build our surroundings. Without color, our world would be lifeless and sad. It is essential to our built environment, especially for teenagers, people who are partially blind, adolescents, and those who, for one reason or another, feel confined and dissatisfied with their way of life. Our brains are programmed to focus on things that stand out from our surroundings in terms of color. Which qualities and traits we associate with a person are influenced by the color of her clothing. Depending on the context, it may be culturally prejudiced due to political movements or historical occurrences. This review clarified the significance of this therapy and its advancement in the field of psychology, raised awareness among today's youth, and added a fresh perspective to this investigation.

Research Article **Published Date:- 2023-08-28**

The Effect of Humidity on Blood Serum Pattern Formation and Blood Transfer

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A detailed knowledge of the drying properties of blood is important for a more complete understanding of the forensic information that may exist at a crime location. Although the effect of relative humidity on the general properties of blood drying has been evaluated, relatively little information exists regarding the alterations of blood serum distribution that may occur during the drying process. Moreover, the influence of humidity on the ability of dried blood drops to transfer from skin to absorbent material has never been studied. The data in the current report show that blood serum pattern formation is distinctly altered by increased humidity in drying drops of blood. In addition, these data document that high humidity conditions were sufficient to remoisten dried blood drops such that they were able to transfer to the absorbent material, with the original bloodstain pattern maintained.

Mini Review **Published Date:- 2023-08-14**

Effect of Pesticides on Human Health

The demand for pesticides has increased in today's world of expanding population in order to boost crop productivity and eliminate undesirable plants (weeds) that grow alongside the primary crop. Along with the various benefits, it is also used in animal farms to get rid of pests. This has an impact not only on humans but also on animals and the environment. The usage of pesticides has increased, and occasionally some of them linger in the food products they are applied to, a condition known as pesticide residue. This residue is linked to human health and can result in a variety of diseases and disorders. In the current environment, even pesticides that are marketed as benign have negative long-term effects and exacerbate issues like bioaccumulation and bio-magnification. To avoid food contamination with pesticides, different methods like crop rotation, organic farming, and integrated pest management should be used as alternatives. Today, it is essential for all pesticide users to be aware of the risk and proper handling of these pesticides. New methods of pest management should be fostered in the realm of development.

Short Review **Published Date:- 2023-07-24**

Variation in Genuine Handwriting While Writing on an Unusual Surface

Forensic handwriting analysis is a specialized field within forensic science that aims to identify and compare handwriting samples for investigative purposes. This scientific note provides an overview of the fundamental principles, methodologies, and techniques involved in the examination of handwriting evidence. The note explores the importance of handwriting analysis in criminal investigations, discusses the underlying scientific principles, and highlights the challenges faced by forensic experts in this field. Additionally, it explores the advancements in technology that have aided the analysis of handwriting and conclude with the potential future directions of research in forensic handwriting analysis. This study focuses on the natural variation that occurs due to the unusual surfaces of tables and bricks, the variation occurs mostly in the class characteristics of the person like slant, speed, line quality, alignment, etc. Samples are collected on two different surfaces; a table and a wall (smooth and rough surfaces). And on the basis of these two surfaces, the variations in the characteristics of the individual are observed. The significance of the research is to find out the range of natural variation that occurs in the individual handwriting whenever there is a change in the writing surface.

Review Article **Published Date:- 2023-07-19**

Review of the Efficiency of Ten Different Commercial Kits for Extracting DNA from Soil Mixed Biological Samples

Soil-mixed bodily fluids are the most common kind of evidence at outdoor crime scenes. This biological evidence contains DNA, which is a key component of forensic science's ability to prove an accused person's guilt because it connects the victim and suspect to the crime scene and aids in identifying the offender and victim. The yield of DNA is significantly influenced by factors including temperature, humidity, storage environment, time since deposition, etc. DNA degradation is caused by a variety of microbes, bacteria, humic acid, and other substances present in soil. Nowadays for DNA extraction, a variety of commercial DNA extraction kits was used now. This paper's objective is to compare the efficiency of ten different commercial kits used to extract mixed DNA samples. It has been observed that samples stored at a low temperature (-20 °C) are the best for soil blood mixture samples. Compared to samples paired with other types of soil (silt, clay, and marshland), sand soil had the largest production of DNA using the QIAmp investigator kit (Qiagen). Blood Miniprep kit extractions were mostly inhibited, the control that amplified confirms that this kit was the worst in terms of DNA extraction potency. The samples with fewer dirt particles had a much greater yield of DNA.

Research Article **Published Date:- 2023-04-26**

Estimating minimum post-mortem interval in a Nigerian murder case using Chrysomya megacephala (Fabricius, 1794) (Diptera: Caliphoridae): The first use of forensic entomology

Introduction: This paper presents the first application of forensic entomology in a murder investigation in Nigeria involving the remains of a 54-years victim, on January 9th, 2019 in a shaded wooded area in advanced decomposition, with no clear indication of the time of death.
Objectives: To estimate the minimum post-mortem interval of a 54-year-old corpse recovered in the advanced decomposition stage using the blowfly Chrysomya megacephala and the Advance-Degree-day (ADD) method.
Results: An autopsy report revealed multiple wounds to the forehead including a bullet hole. Dead embalmed dead maggots recovered from the body were identified as C. megacephala, and an accumulated degree-day model was used to estimate the minimum post-mortem interval. The findings revealed that the recovered larvae were still within the third-instar stage and had accumulated thermal energy between 58 hours (= 1.6 days, equivalent to 38.7 ADD) and 102 hours (= 2.8 days, equivalent to 68.0 ADD), suggesting that the body may have been exposed to insect activity between January 1st and 9th January 2019 after expanding the range to cater for some uncertainties.
Conclusion: In this Nigerian murder case, forensic entomology used the calliphorid species C. megacephala to estimate the minPMI to be between 2 and 9 days before the body was discovered, which translates to 1st - 9th January 2019 after consideration of some uncertainties and limitations. This confirmed the crucial role that insects play in providing valuable evidence to complement forensic pathological findings in homicides when conventional methods failed. Notwithstanding difficulties with employing insect evidence in forensic investigations in Nigeria, the application of this modern forensic technique has the potential to aid in the resolution of many unsolved murder cases and expedite the delivery of justice. The ability of law enforcement agencies in Nigeria to use the potential of insects in criminal investigations can be improved through collaborations and training with professionals from diverse professions.

Research Article **Published Date:- 2023-03-28**

Development of qualitative GC MS method for simultaneous identification of PM-CCM a modified illicit drugs preparation and its modern-day application in drug-facilitated crimes

Prescriptions for psychoactive substances such as Pregabalin, Methamphetamine, Caffeine, Clonazepam and Mirtazapine (PM-CCM) are common in the treatment of a variety of disorders. Indeed, the PM-CCM has been used in different therapeutic areas, including insomnia, anxiety, seizure disorders, etc. Unfortunately, these psychoactive substances are present in the illegal street market, leading to a lot of drug abuse among some addicted users, road insecurity and suicide. Hence, it has become essential to validate and develop a rapid and effective method to analyze the PM-CCM, a modified illicit drug, for drug abuse in the forensic sciences. A simple, rapid, specific and sensitive Gas Chromatography-Mass Spectrometry(GC-MS) method has been developed for the identification of Pregabalin, Methamphetamine, Caffeine, Clonazepam and Mirtazapine (PM-CCM) in forensic exhibits. At room temperature, the sample was ultrasonicated for 5 minutes before being extracted with methanol. A highly precise auto-injector is used to inject a very small quantity of samples for analysis. Helium is used as a carrier gas with a flow rate of 1 ml/min. The separation of PM-CCM was performed on SH-RXi-5 MS, ID.25 mm, film thickness. 25 µm, length of 30 m column. The constituents of PM-CCM were identified by the mass-to-charge ratio (m/z ratio) of fragments of the parent compound by comparing them with the NIST-17 MS Library. Separation and identification of PM-CCM were achieved within a 15-minute run. The proposed method has been successfully used for the routine analysis of PM-CCM in complex illicit drug preparations and in forensic exhibits as well. The application of above discussed qualitative analysis method and screening of PM-CCM, modified illicit drug samples demonstrates the potential and applicability of the technique to the fast chemical profiling of illicit samples.

Research Article **Published Date:- 2023-03-21**

Requirement for object-oriented database management systems in forensic science

The complex requirements of a database system for recording regulated chemicals exceed the capabilities of a relational database system. Inheritance, which is part of object-oriented programming, must also be logically transferred to chemical objects. This issue is illustrated here by means of examples of the Chemical Weapons Convention (CWC) and the German version of the New Psychoactive Substances Law (NpSG).
