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Power of Forensic Evidence in Solving Crimes

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ABSTRACT

Forensic laws and evidence are important part of modern crime investigation. The remains of criminals or the pieces of evidence collected at crime scenes by investigators help in identifying the criminals and solving cases. This article holds the importance of forensics and forensic investigation to help the investigators reach the point with 100% verifications. Forensic evidence covers DNA Analysis, fingerprint analysis, and other various forms of digital analysis. This article along with its importance also highlights the limitations of forensic analysis during investigations and by taking the improvement steps for criminal identification.

Keywords: Digital Forensics, Crime, Investigation, DNA, Analysis.

1. INTRODUCTION

The justice holds its importance with the help of truth revealed. The face and hand behind the crime should be exposed and for this, the investigation departments are bringing innovations to their research methods. Detailed investigations are being done to reach the culprit within no time. The investigations step into the scientific methods of examination which provide a better understanding of the case with perfect evidence analysis that helps to identify the criminal of a certain case. Various scientific analysis methods are being used in this era to solve the toughest of cases and to bring out every possible solution from a piece of evidence. The criminal can be identified in the most unexpected ways. This innovation in modern times in investigation departments makes it possible to get the most authentic results out of any crime scene shreds of evidence. The most authentic manner to identify the criminal or the responsible person for any crime is forensic analysis helping in its way [1].

Various types and forms in which forensic analysis can be done on the given evidence are invented. Several ways to confirm the real criminal are made with the help of scientific forensic analysis. DNA analysis is one of the most modern types of forensics and investigators are also introducing in their investigations [2]. Fingerprinting is also a type of Forensic Analysis which is used with the help of fingerprints on either weapons or crime-related objects in the crime scene.

The Ballistic Analysis along with the Toxicology are important aspects of today's investigatory time [3].

DNA helps to identify the criminal with the help of their genetical identity. DNA analysis can be done on hair, nails, blood, or any material left at the crime scene. It can be applied to the people who are suspected of any crime. In modern times DNA analysis is not only for biological purposes but also holds its importance in investigations to reach the culprit. The DNA can be detected with a small piece and can pull out every information related to the culprit. Fingerprint analysis is the other main investigation weapon in modern times. The fingerprint analysis can be done with the help of detecting the fingerprints of the culprit by examining the objects touched by the criminal. It can be a door handle, chair, table, or weapon [4]. The weapon found around the crime scene is enough to reach t the criminal. The weapon holds the fingerprints and the forensic analysis can identify the criminal with every information possible.

2. RESEARCH METHODOLOGY

The Research Analysis has been done on the importance and use of forensic science and its use in daily life [5]. With the help of scientific Forensic Analysis and the Law/ Justice Departments, research on this sensitive topic has been done. The methodology involves the following points and methods:

Literature Review: The work that has been done on Forensics or the available real-time research over forensics in the form of articles, books, arts, or case studies the context and idea have been taken along with the theoretical framework.

Case Studies: The real-time case studies that involve forensics in their investigations are helping to have a clear idea about forensics and its use in criminal departments. It shows how forensics techniques are utilized to achieve the best and most authentic results.

Expert Interviews: The experts or forensic scientists' interviews are taken to learn and to have deep learning about forensics and its use in daily life and how it helps in the investigation to reach the best results. The experts with their experience as a part of the scientific forensic teams hide a lot of truth about the investigations based on forensic analysis.

Quantitative Analysis: Quantitative analysis is done on the sample of the forensic evidence. The research has been done on techniques and studies over the forensic steps taken on pieces of evidence. To study the effectiveness of

forensic techniques and to learn about the innovations of the research methods [6].

3. DATA ANALYSIS

3.1. Corroborating Testimonies

Such proof can be useful for the witness, victim, or suspect of the crime in question to prove the incidents narrated in the court. For instance, a rape suspect can be pinned to the scene by the recovered DNA which can corroborate a witness statement [7].

3.2. Establishing Facts

On this basis, there is a variety of ways in which forensic analysis can help prove certain seminal facts in the case. This includes time of death through forensic pathology, cause of death through toxicology and the chronology of occasions through crime scene replication [8].

3.3. Exonerating the Innocent

It is also important to note that forensic evidence can work for the benefit of the accused individuals who have been accused through a wrongful accusation. Amnesty international has pointed to the fact that DNA testing for instance, has played a critical role in exonerating bad samples where a suspect was proved beyond doubt that he did not commit the crime [6].

3.4. Identifying Perpetrators

Tool like fingerprint, DNA, and face identification technologies assist in the identification of criminals. This evidence can play a vital role especially in cases where the issue of identification of the suspect is critical.

3.5. Linking Crimes

Criminal evidence may interconnect different cases that do not appear to be related to one another. For example, by comparing ballistic data, it is possible to identify that one and the same weapon was used during different criminal attacks, which may point either to a single offender or to interconnected occurrences [8].

3.6. Providing Objective Evidence

People are likely to give and perform in a manner that will favor either the prosecution or the defense depending on their beliefs; however, forensic evidence is scientifically and impartial in nature. It benefits jurors and judges as it provides an opportunity to deal with actual facts as opposed to stereotyped viewpoints. Supporting Prosecutorial Arguments [9].

Criminal lawyers most often depend on expert evidence, which could include favorable conclusions from forensic experts. This sometimes ranges from proving the sequence and distribution of blood spatter patterns to electronic-evidence such as messages that link a suspect to the crime.

3.7. Challenging Defense Claims

They can also be used to disprove the defense claims that would have been produced as encompassing the facts of the case. For instance, assuming a defendant wanted to deny that they were in a certain location at the time of the crime, then hair fibers matching them or footprints linked to them would be compelling evidence against them.

Forensic evidence in court cases: How forensic evidence is used in court and some of the types of evidence to be expected [10].

DNA Evidence: In the trial of O. J. Simpson, DNA played a critical role, the sampling, collection, analysis as well as the presentation of the results formed the basis of controversy. Although it played the final blow in contribution to the event that happened in the case, it demonstrated the role of DNA in forensic science [11].

Fingerprint Analysis: Spain also used fingerprint in criminal identification such as in the Madrid train bomb in 2004. An initially wrong match caused an innocent man to be arrested, but improved examination and later identification proved this man innocent of the crime hence explaining the added value of accuracy in forensic work.

Digital Forensics: Pascal points out that in most contemporary incidents, digital forensics has proven to be essential. The online black market known as the Silk Road was explored with much reliance on digital forensic and the mastermind of the site, Ross Ulbricht, was arrested.

Perhaps, the most illuminating evidence required by the judiciary is forensic evidence because such evidence is empirical proof that

guides the judicial system normally in delivering justice accurately.

4. RESULTS

Other legal and ethical problems that rise in connection with the processes of providing forensic traces and giving the qualified expert opinion, such as contamination and admissibility of the traces' reliability, should be solved to guarantee justice. Precedents like wrongfully convicted people, as with the case of the Central Park Five, demonstrate the significance of preserving high measures of rigor and continuously refining/proposing forensic practices. Furthermore, the use of artificial intelligence, particularly, the machine learning in the field of forensic should enhance the performance of the criminal investigations, the identification of biometrics should also incline enhanced performance and accuracy. All these must be premised with a commitment to ethical norms and equity in delivery of justice in the courts [12].

5. CONCLUSION

For instance, the application of DNA as testified by Butler helped secure the guilt of a vicious serial killer Ted Bundy as well as the recognition of victims of the 9/11 calamity. However, the reliance on forensic evidence also raises legal and ethical considerations, as discussed by Casey in "Digital Evidence and Computer Crime: These resources include the SAM database and WEKA, an integrated environment for data mining and knowledge discovery, the Journal of Forensic Science, Computers, and the Internet and the National Institute of Justice. Questions like whether the evidence might have been contaminated, whether the forensic techniques used are one hundred percent effective, or even the handling of the evidence from the crime scene through to the analysis are questions that can make a lot of difference in the delivery of justice. Szymakowski Shaken by the Central Park Five case, it becomes evidently clear that stricter standards must be maintained and executed in forensic methods. In the future, the field of forensic science has even more possibilities and prerequisites as highlighted by the National Institute of Justice. AI and machine learning in aspects of forensic examination, the advancement of improved identification using biometrics, and the combination of forensic proof with other instruments in criminal proceedings are expected to increase the effectiveness and efficacy of criminal investigations. The innocence of Cassie and her friends is proven

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