The West Bengal National University of Juridical Sciences



ANNUAL REPORT

2022 - 2023 and 2023 - 2024

CENTRE FOR STUDIES & RESEARCH IN FORENSIC SCIENCES

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“From Crime Scene to Court Room, the future of Justice is being written in the language of Forensic Science - Our Graduates will be part of this transformation”

Prof. (Dr.) Nirmal Kanti Chakrabarti

Hon’ble Vice Chancellor, WBNUJS, Kolkata

Table of Content

01 About the WBNUJS

02 About the Centre

03 Objetives, Vision and Mission

04 Mode of Financing

05 Activities

Structure of Centre



PATRON

Prof. (Dr.) Nirmal Kanti Chakrabarti

Hon'ble Vice Chancellor,

WBNUJS, Kolkata



DIRECTOR

Dr. Ankit Srivastava

Associate Professor, Forensic Science,

WBNUJS, Kolkata





From the Vice Chancellor’s Desk

In today's interconnected world, crime is a major concern. The criminal justice system, comprising law enforcement, courts, and correctional facilities, maintains order, protects individuals, and administers justice.

Forensic science is vital in pursuing truth and justice, using multidisciplinary approaches to analyze evidence in criminal investigations. The Centre for Studies and Research in Forensic Science embodies careful planning, dedication, and a commitment to advancing forensic knowledge and expertise. It offers comprehensive education, equipping students with essential skills, knowledge, and ethical grounding.

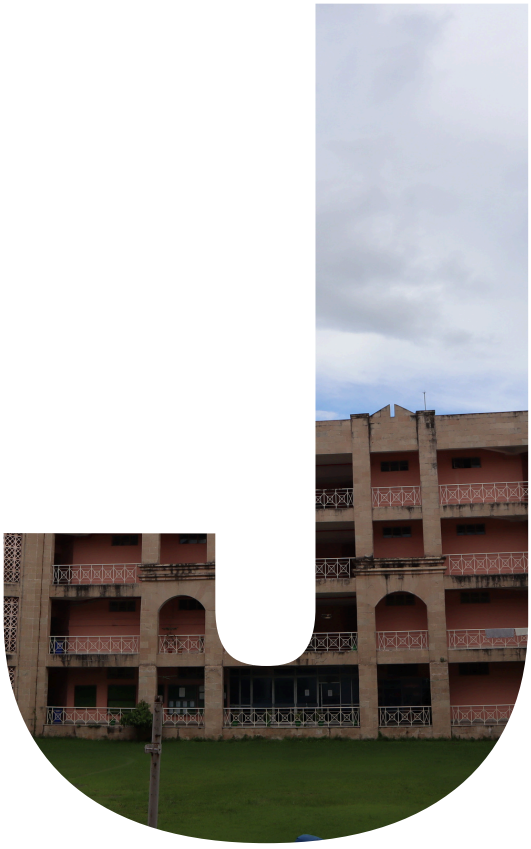
The Centre aims towards advanced and cutting edge research in different domains and sub-domains of Forensic Sciences thorugh collaboration with top tier law enforcement agencies, institutes, organizations and research institutes across India and at the global level. Additionally, the Centre provides consultancy, training, and workshops to support the criminal justice system.

I am deeply grateful to everyone who contributed to this vision and look forward to the Centre's transformative impact on our institution and society.

Prof. (Dr.) Nirmal Kanti Chakrabarti
Hon’ble Vice Chancellor, WBNUJS











About WBNUJS

WBNUJS was established under the National University of Juridical Sciences Act, 1999, and it officially started functioning in 2000. It was set up with the aim of promoting legal education and research in India. The university boasts a highly qualified and experienced faculty, many of whom are leading experts in their respective fields of law. Their expertise contributes significantly to the quality of legal education provided at NUJS.

While it covers various fields of law, very recently it became the first National Law University in India by starting masters and doctoral degrees in Forensic Sciences. This year it took one more historical step forward as it has started B.Sc. LL.B. (Hons.) in Criminology and Forensic Science as the first course of its kind in India.

The campus of NUJS is equipped with state-of-the-art facilities, including modern classrooms, a well-stocked library, research centers, Forensic Science Laboratories and moot courtrooms. These facilities enhance the learning experience for students. The university encourages research in various legal areas. It has several research centers and institutes dedicated to specific branches of law as well as Forensic Science studies. The university also publishes various journals and publications, contributing to legal scholarship.

NUJS collaborates with various national and international institutions to facilitate academic exchange, research, and collaboration. This university stands as a beacon of legal education and research in India, producing skilled professionals who are well-equipped to excel in the legal profession, academia, public service and to assist criminal justice system.

About the Centre for Studies & Research in Forensic Sciences

Forensic Science is the use of scientific methods or expertise to investigate crimes or examine evidence that might be presented in a court of law. Long-used types of forensic science—fingerprint examination, handwriting analysis, firearms and toolmark comparison, and other forms of pattern and impression evidence—are mainstays of criminal prosecution. Though they represent varied disciplines, all forensic scientists face a common set of challenges. For roughly a hundred years, these comparison and identification methods have regularly and routinely been employed as legal evidence. For most of that period, courts, attorneys, jurors, and the public, as well as forensic analysts themselves, have largely accepted this evidence as trustworthy and uncontroversial. In the last few years, the situation has changed dramatically. These methods and techniques now face more criticism and scrutiny than ever before. For roughly a hundred years, these comparison and identification methods have regularly and routinely been employed as legal evidence. For most of that period, courts, attorneys, jurors, and the public, as well as forensic analysts themselves, have largely accepted this evidence as trustworthy and uncontroversial. In the last few years, the situation has changed dramatically. These methods and techniques now face more criticism and scrutiny than ever before. Several researchers are worked on different kinds of forensic problems for the admissibility of evidences under the aegis of different research organization world-wide like American Academy of Forensic Sciences etc. Research is utmost required in the field of forensic sciences.

Centre for Studies & Research in Forensic Science (CSRFS) is established in July 2022 and first of its kind in India as no independent and exclusively research-based organization(s) are very few in this country till date. Exhaustive research is the key to enormous development of any scientific filed and forensic science is still in its early stages of development in comparison to the other fundamental as well as applied sciences. In a country like India, the need of forensic science is ever-increasing. Hence, the advancement in the technological aspect of this scientific discipline needs an instant catalytic boost up. The CSRFS will become the pioneer for research advancements in Forensic Science in India as well as at international scenario in near future by developing rapid, errorless and robust techniques for evidence analysis with better admissibility in the court of law.





Our Objectives

- **Integration of basic and applied science fields with forensic science**
- **Evaluation and modification of the existing techniques for evidence analysis**
- **Validation of recent advancements in the field of forensic science**
- **Development of cutting edge technology in Forensic Science**
- **Miniaturization and development of field deployable technology for rapid analysis**
- **Establishment of the protocols for better legal admissibility of methodologies used in Forensic Science**

Vision And Mission

Vision

The Centre for Studies & Research in Forensic Sciences aims to be a leading institution in the field of forensic science education and research, dedicated to advancing the understanding and application of forensic methodologies. Our vision is to contribute significantly to the justice system by developing innovative forensic technologies, promoting ethical practices, and fostering a collaborative environment for interdisciplinary research. We strive to empower the next generation of forensic scientists with the knowledge, skills, and integrity required to meet the challenges of modern forensic investigations.

Mission

- **Educational Excellence**: Provide high-quality education and training in forensic science to equip students with the theoretical knowledge and practical skills needed for careers in forensic investigation, research, and related fields.
- **Cutting-edge Research**: Conduct innovative and impactful research to advance the science of forensics, developing new techniques and methodologies that enhance the accuracy and reliability of forensic analyses.
- **Interdisciplinary Collaboration**: Foster collaboration among experts from various disciplines to address complex forensic challenges, encouraging the exchange of ideas and the integration of diverse perspectives.
- **Ethical Standards:** Promote the highest ethical standards in forensic science practice, ensuring that our graduates and researchers adhere to principles of integrity, objectivity, and impartiality.
- **Community Engagement**: Engage with law enforcement agencies, legal professionals, and the broader community to provide expert forensic services, support criminal justice initiatives, and enhance public understanding of forensic science.
- **Global Impact**: Establish partnerships and collaborations with national and international institutions to contribute to the global advancement of forensic science and to stay at the forefront of emerging trends and technologies.



Mode of Financing

The Centre proposes to work in collaboration with various governmental, non-governmental and academic institutions in pursuit of its objectives. In particular, liaison would be actively sought with various renowned educational institutions within the state of West Bengal (such as University of Calcutta, Presidency University, Jadavpur University etc.), within India (Punjabi University, Patiala, National Forensic Science University, Gandhinagar, Govt Institute of Forensic Science, Nagpur, Dr. H S Gour Central University, Sagar, Bundelkhand University, Jhansi, Banaras Hindu University, Jharkhand Raksha Shakti University, Ranchi, All India Institute of Medical Sciences, New Delhi etc.) as well as beyond the country (University of Granada, Spain; Towson University, USA; Nottingham Trent University, UK; Angila Ruskin University, UK and others). Central/State Government organizations such as the Department of Science & Technology (DST), Directorate of Forensic Science Services (DFSS), Central/State Forensic Science Laboratories, Indian Council of Medical Research (ICMR), Department of Biotechnology (DBT), Bureau of Police Research & Development (BPR&D), University Grants Commission (UGC), West Bengal Council of Science & Technology (WBCOST) etc. would be approached for securing funding for studies which will be focused on various forensic applications and would play a crucial role in criminal justice system. Specifically for studies and research involving population variations prevalent in the various states of India, sponsorship may be sought for from the respective state governments and related departments. For studies involving forensic applications of private sponsorship may also be explored. Various organizations might also be approached in this regard for funding of projects, dissemination seminars and conferences. The Centre would also like to develop focused courses including courses delivered in distance education mode, offered to candidates from outside the university, in order to raise the funds necessary for its various activities. State-sponsored schemes such as the Scheme for Promotion of Academic and Research Collaboration would also be given due consideration as potential sources of necessary funds.. At this stage, the Centre does not seek any direct financial support from the university, other than permission to use existing infrastructure and human resources including working hours of the faculty and staff involved.


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Activities of CSRFS

- Organised Special Lectures
- Organised International Conference
- Publications



Special Lecture - 1

TOPIC

CYBER FORENSICS IN 21ST CENTURY: CHALLENGES AND SOLUTIONS

Date: December 18, 2022 **Time:** 05:00 PM onwards



Speaker

MR. AMIT DUBEY
CYBER SECURITY ADVISOR
TECH MAHINDRA LTD, NOIDA



Special Lecture - 1

TOPIC

CYBER FORENSICS IN 21ST CENTURY: CHALLENGES AND SOLUTIONS

Date: December 18, 2022 **Time:** 05:00 PM onwards

With a captivating introduction, Mr. Amit Kumar delved into the challenges faced by cyber forensic investigators in the current landscape. He outlined the complexities of dealing with sophisticated cybercrimes, including identity theft, ransomware attacks, and digital fraud. The audience listened attentively as he painted a vivid picture of the constantly shifting digital battlefield. To illustrate his points, Mr. Kumar shared compelling real-world cases, showcasing the intricacies of cyber investigations. He also highlighted the importance of staying ahead of cybercriminals, emphasizing the need for continuous education and adaptation in the field. The lecture seamlessly transitioned into a discussion of the cutting-edge solutions and methodologies employed by cyber forensic experts. Mr. Kumar explored advancements in forensic tools, artificial intelligence, and machine learning, providing insights into how these technologies are reshaping the landscape of cyber investigations. The audience actively engaged in the Q&A session that followed, posing thought-provoking questions about the ethical considerations in cyber forensic practices, the role of international collaboration, and the future of digital forensics in the face of emerging technologies. As the lecture concluded, attendees left the auditorium with a newfound appreciation for the complexities and importance of cyber forensic investigations in the 21st century. Mr. Amit Kumar's expertise and the symposium's focus on cybersecurity served as a catalyst for further discussions and collaborations in the ongoing battle against cyber threats.

In an age dominated by technology, the field of Digital and Cyber Forensics holds paramount importance in criminal investigations. The special lectures in this domain provided a comprehensive overview of the ever-evolving landscape of cybercrime and the methods employed to investigate and mitigate digital threats.

Special Lecture - 2

T O P I C

FORENSIC PSYCHOLOGY: EMERGING TRENDS IN CRIMINAL INVESTIGATION

Date: December 20, 2022 **Time:** 11:00 AM onwards



Speaker

DR. ASHA SRIVASTAVA
DIRECTOR
CFSL CBI, NEW DELHI



Special Lecture - 2

TOPIC

FORENSIC PSYCHOLOGY: EMERGING TRENDS IN CRIMINAL INVESTIGATION

Date: December 20, 2022 **Time:** 11:00 AM onwards

On December, 20, 2022, distinguished visiting professor, Dr. Asha Srivastava (Director, CFSL, New Delhi, India), delivered a very informative and technical lecture on fundamental aspects of forensic psychology and how students can choose this sub-domain of forensic science as their career in future. She demonstrated few ground-breaking cases in which she interrogated suspects seeking the truth. There was a very productive question and answer session with the students, faculties and other staffs of the university present during that event.

The lecture delved into the latest trends in forensic psychology, touching on topics such as the use of advanced technology in criminal profiling, neuroimaging techniques to understand criminal minds, and the integration of psychology in criminal investigations. Dr. Asha Srivastava captivated the audience with gripping case studies, illustrating how forensic psychology had played a pivotal role in solving complex criminal cases. The audience leaned forward as she recounted real-life scenarios where psychological insights had led to breakthroughs in investigations. The use of multimedia elements enhanced the lecture experience. Videos and animations demonstrated the application of forensic psychology techniques, offering a visual understanding of how profiling and behavioral analysis contribute to solving crimes. The lecture wasn't a one-way street as Dr. Srivastava encouraged audience participation, posing thought-provoking questions and inviting opinions on the ethical considerations of applying psychology in criminal justice. Attendees eagerly engaged in discussions, creating an intellectually stimulating environment. The lecture concluded with a dynamic question and answer session. Attendees posed insightful questions, seeking clarification on specific forensic psychology techniques and their applications. Dr. Srivastava, with her expertise, provided comprehensive answers, fostering a sense of collective knowledge.

Special Lecture - 3

TOPIC

NUCLEAR FORENSICS: A 21ST CENTURY APPROACH

Date: January 21, 2023 **Time:** 11:30 AM onwards



Speaker

PROF. ALOK SRIVASTAVA
SENIOR PROFESSOR
PUNJAB UNIVERSITY, CHANDIGARH



Special Lecture - 3

TOPIC

NUCLEAR FORENSICS: A 21ST CENTURY APPROACH

Date: January 21, 2023 **Time:** 11:30 AM onwards

On January 21, 2023, Prof. (Dr). Alok Srivastava (Senior Professor, Department of Chemistry, Punjab University, Chandigarh, India), delivered an interesting and insightful lecture on the scope of nuclear forensics in the present scenario. With eloquence and precision, Prof. Srivastava guided the audience through the technical intricacies of nuclear forensics, from the analysis of nuclear materials to the identification of their sources. He elucidated the cutting-edge technologies and techniques employed in forensic investigations, showcasing the remarkable strides made in the field. Drawing on compelling case studies and real-world scenarios, Prof. Srivastava illustrated the pivotal role of nuclear forensics in bolstering international security and preventing nuclear terrorism. His insights into the challenges and opportunities inherent in nuclear attribution captivated the audience, sparking lively discussions and thought-provoking questions. He discussed the possibilities of nuclear science in forensic investigation with adequate examples. As the lecture drew to a close, Prof. Srivastava left the audience with a profound sense of urgency and hope. He emphasized the collective responsibility of the global community to harness the power of nuclear forensics for the greater good, urging collaboration and cooperation across borders and disciplines.

This Nuclear Forensics lecture offered comprehensive insights into the techniques used to trace the origin and history of nuclear materials, particularly in cases of illicit trafficking, nuclear terrorism, or accidental release. The lecture covered various topics, like, isotopic, elemental, and physical-chemical analyses that enable nuclear forensic experts to determine the source, age, and history of nuclear materials, providing critical information for law

enforcement and intelligence agencies. The lecture further highlighted the multifaceted role of nuclear forensics in contributing to national security by deterring nuclear threats, facilitating the attribution of nuclear materials used in malicious acts, and supporting law enforcement efforts in preventing nuclear terrorism. The discussions delved into case studies that demonstrated the practical applications of nuclear forensics, particularly in tracking the movement of nuclear materials and assessing the credibility of nuclear threats.

Special Lecture - 4

TOPIC

FORENSIC INVESTIGATION AND HUMAN RIGHTS: A VIEW POINT

Date: January 28, 2023 **Time:** 11:00 AM onwards



Speaker

PROF. ADARSH KUMAR
SENIOR PROFESSOR
AIIMS, NEW DELHI



Special Lecture - 4

TOPIC

FORENSIC INVESTIGATION AND HUMAN RIGHTS: A VIEW POINT

Date: January 28, 2023 **Time:** 11:00 AM onwards

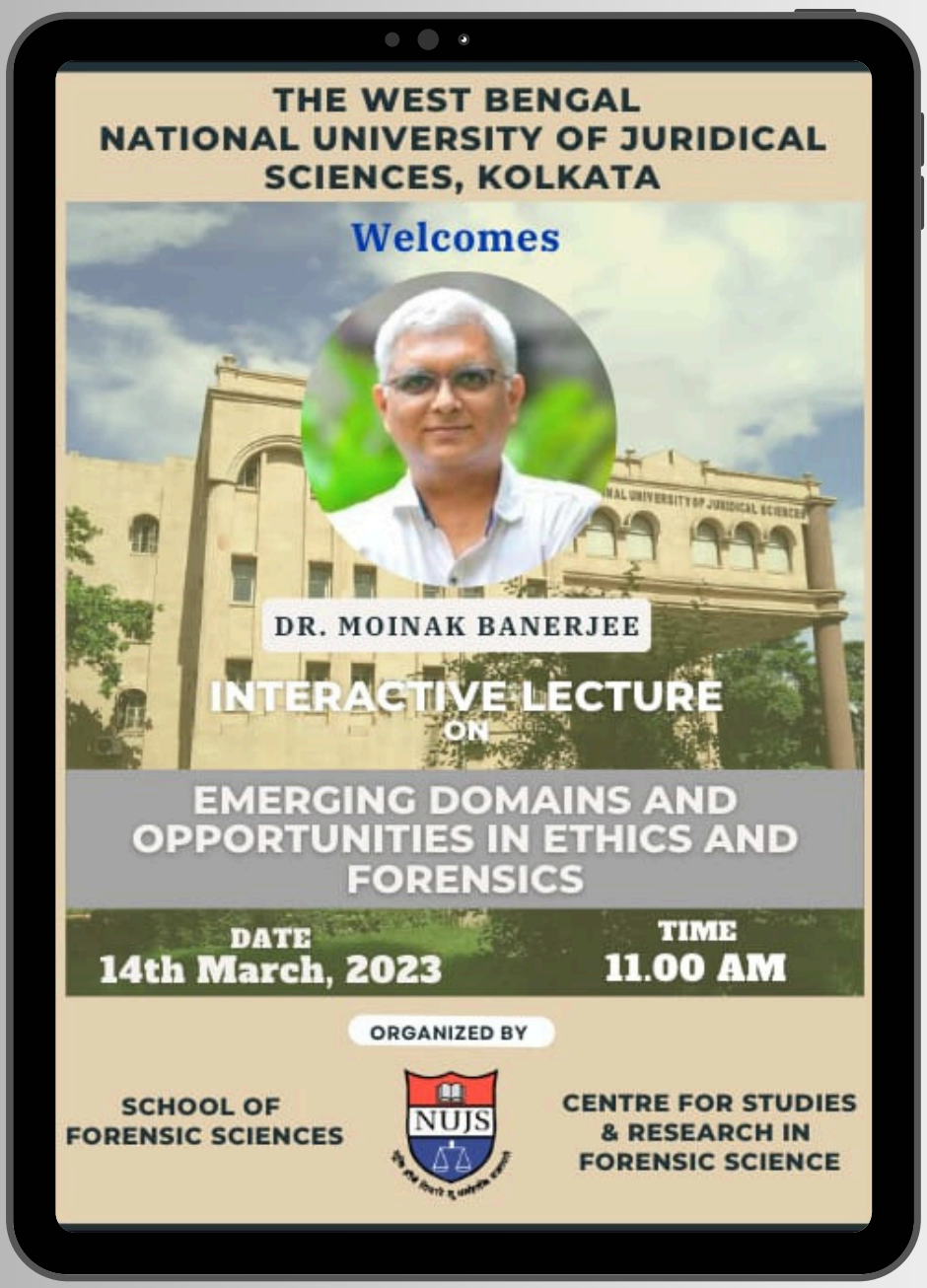
On January 28, 2023, Dr. Adarsh Kumar (Professor, All India Institute of Medical Sciences, New Delhi, India), delivered an informative lecture on recent trends of forensic medicine in India. The programme started at 11 AM sharp, in the academic block of the West Bengal National University of Juridical Sciences. Our esteemed speaker was felicitated by our Head of the Department, School of Forensic Sciences and the Director of Centre for Studies and Research in Forensic Sciences, Dr. Ankit Srivastava. Prof. (Dr.) Adarsh Kumar started his lecture with how forensic investigation and human rights intersect at a critical juncture, forming a crucial aspect of legal and ethical considerations. He emphasized on the realm of forensic science, where, the pursuit of truth must align with the principles of justice and respect for human rights. A viewpoint on this connection emphasizes the responsibility of forensic investigators to uphold the dignity and rights of individuals involved in legal processes was provided to the audience. This perspective underscores the need for transparent and ethical practices within forensic investigations, ensuring that evidence collection, analysis, and presentation adhere to the highest standards. He focused on the process of balancing the quest for truth with the protection of human rights which becomes paramount in fostering a justice system that is both effective and morally sound. The students and other respected faculty members who were present in the audience learned that as technology is evolving and forensic techniques are advancing, maintaining a viewpoint that integrates human rights principles becomes essential for fostering public trust and ensuring the fair and just treatment of all individuals within the legal system. At the end of the lecture, a vote of thanks was given by Dr. Bhavya Srivastava, Assistant Professor, School of Forensic Sciences, WBNUJS.

Special Lecture - 5

T O P I C

EMERGING DOMAINS AND OPPORTUNITIES IN ETHICS AND FORENSICS

Date: March 14, 2023 **Time:** 11:00 AM onwards



Speaker

DR. MOINAK BANERJEE
SCIENTIST - G
RGCB, KERALA

Special Lecture - 5

TOPIC

EMERGING DOMAINS AND OPPORTUNITIES IN ETHICS AND FORENSICS

Date: March 14, 2023 **Time:** 11:00 AM onwards



On March 14, 2023, Dr. Moinak Banerjee (Scientist-G, Rajiv Gandhi Centre for Biotechnology, Kerala, India), delivered an informative lecture on recent trends of forensic genetics in India and around the globe. The special lecture was arranged in room 107 of the academic block of The West Bengal National University of Juridical Sciences. In the audience, distinguished faculty members from the department of Law and School of Forensic Sciences, WBNUJS, were present. The lecture started at 11AM on the date of 14th March, 2023 where our distinguished speaker Dr Moinak Banerjee introduced the realm of "Emerging Domains and Opportunities in Ethics and Forensics" to our audience by focusing on witnessing a dynamic intersection of ethical considerations and forensic methodologies, fueled by advancements in technology and societal changes. He indulged the audience in this rapidly evolving landscape where professionals are always navigating novel ethical challenges arising from the digital era, including issues related to data privacy, cybersecurity, and artificial intelligence. Moreover, the emerging opportunities which lie in the synthesis of ethics and technology, as organizations seek professionals capable of ensuring responsible and transparent practices in the development and deployment of cutting-edge technologies were thoroughly discussed, and how this convergence opens new avenues for interdisciplinary collaboration, encouraging ethical decision-making and innovation in the ever-evolving field of ethics and forensics enthralled every member of the audience present. Dr. Moinak also shared a very interesting insight on the daily consumption of radioactive substances by human beings by giving a presentation based on his own research which revolved around the quantification of radioactive elements like polonium in branded cigarettes. The lecture came to an end with our esteemed speaker addressing the questions from our audience and a vote of thanks.

Special Lecture - 6

TOPIC

FORENSICS AND BEYOND: THE CONVERGENCE OF SCIENCE AND TECHNOLOGY IN CRIMINAL ANALYSIS

Date: September 02, 2023 **Time:** 9:30 AM onwards



Speaker

DR. NAWAB JOHN DAR
SCIENTIST
SALK INST. OF BIOLOGICAL SCIENCE, CA, USA

This is the first International Special Lecture organised by the Centre for Studies and Research in Forensic Sciences, WBNUJS. This lecture was conducted online where our distinguished speaker addressed the students and other distinguished faculty members of the School of Forensic Sciences, The West Bengal National University of Juridical Sciences. The title of the special lecture was "Forensics and Beyond: The Convergence of Science and Technology in Criminal Analysis". This discourse encapsulated the dynamic and intricate intersection between the continuous progression of scientific advancements and the ever-evolving landscape of technological innovations within the realm of criminal analysis.Dr Dar provided the audience with the knowledge about how this multifaceted terrain not only capitalizes on established and traditional forensic methodologies but also seamlessly integrates state-of-the-art technologies, including but not limited to DNA profiling, cyber forensics, and artificial intelligence. The merging of scientific principles and technological capabilities has significantly broadened the scope and effectiveness of criminal investigations, facilitating a more precise and efficient analysis of evidentiary material and this comprehensive approach extends from deciphering intricate crime scenes to unearthing elusive digital traces in cybercrimes. Moreover, he added that the resultant synergy will not only amplify the prowess of forensic professionals in solving cases but will also contribute substantively to the ongoing evolution of the criminal justice system. The special lecture was concluded by our distinguished speaker addressing the importance of the holistic amalgamation of science and technology which stands as a transformative force, reshaping the trajectory of forensics by introducing novel tools and methodologies poised to address the challenges presented by a rapidly changing criminal landscape.

Special Lecture - 7

T O P I C

RECENT ADVANCEMENTS AND CHALLENGES IN FORENSIC QUESTIONED DOCUMENT EXAMINATION

Date: September 16, 2023 **Time:** 11:30 AM onwards



Speaker

DR. AJAY SHARMA
DIRECTOR
FSL, JAIPUR, RAJASTHAN



Special Lecture - 7

TOPIC

RECENT ADVANCEMENTS AND CHALLENGES IN FORENSIC QUESTIONED DOCUMENT EXAMINATION

Date: September 16, 2023 **Time:** 11:30 AM onwards

Dr Sharma began his lecture with a brief on Forensic Science and its relevance in the field of adjudication and how the application of various other subjects of science is the fundamental basis of forensic science. He then gave a brief about the recent advancements in forensic questioned document examination which have witnessed a convergence of traditional methodologies with cutting-edge technologies, significantly enhancing the accuracy and efficiency of the examination process through a PowerPoint presentation which included various criminal cases related to forensic questioned document analysis, solved by himself. He then focused on the integration of advanced imaging techniques, such as spectral analysis and high-resolution imaging, which allows for a more detailed and precise analysis of questioned documents. Additionally, insights were provided to the students on advancements in handwriting recognition software and machine learning algorithms that provide forensic experts with powerful tools to decipher complex patterns and identify subtle nuances in handwriting, signatures, and document alterations. However, these advancements also bring forth new challenges, including the need for continuous training of forensic experts to keep pace with evolving technologies and the potential ethical concerns associated with the use of artificial intelligence in document examination. Dr Sharma concluded the session by addressing the challenges in forensic questioned document analysis which will be crucial to maintaining the integrity and reliability of forensic questioned document examination in legal investigations. This interactive session on questioned document analysis emphasized the study of handwriting, signatures, typewriting, printing, alterations, and alterations. The process of comparing and analyzing handwriting samples, the identification of individual and class characteristics, and the role of exemplars in establishing the authenticity of documents were explored in detail. The session also underscored the challenges faced by forensic document examiners, including the changing nature of document fraud and the use of advanced printing and copying technologies. The integration of technology in document analysis, such as imaging and comparison software, spectral analysis for ink and paper, and video spectral comparison, was discussed in the context of improving the accuracy and efficiency of document examination. The special lecture came to an end by our esteemed speaker addressing the questions put up by the audience and then a vote of thanks which was provided by the Course Coordinator of M.Sc. Forensic Science and Director of Centre for Studies and Research in Forensic Sciences, Dr Ankit Srivastava.

Special Lecture - 8

TOPIC

CYBER VIS A VIS DIGITAL FORENSICS

Date: May 09, 28,42 **Time:** 11:00 AM onwards



DR. MEENAKSHI MAHAJAN
DIRECTOR
FSL, SHIMLA, HIMACHAL PRADESH



Special Lecture - 8

TOPIC

CYBER VIS A VIS DIGITAL FORENSICS

Date: May 09, 28,42 **Time:** 11:00 AM onwards



On June 14, 2024, a guest lecture on "Cyber vis a vis Digital Forensics" was held at The National University of Juridical Sciences from 11:00 AM onwards, featuring Dr. Meenakshi Mahajan, Director, Directorate of Forensic Services, Govt. of Himachal Pradesh. Dr. Ankit Srivastava introduced Dr. Meenakshi Mahajan, who began with an overview of cyber forensics, explaining its importance and common threats such as malware, phishing, and ransom ware. She then discussed the various layers of cyber security and emerging trends like AI in cyber forensics. Transitioning to digital forensics, Dr. Mahajan defined it as the process of uncovering and interpreting electronic data for legal purposes, outlining the key steps: identification, preservation, analysis, and presentation. She highlighted branches including computer, network, mobile device, and database forensics, stressing the importance of maintaining the integrity of digital evidence. Dr. Mahajan elaborated on the relationship between cyber security and digital forensics, explaining how the latter aids in analyzing attack vectors, identifying vulnerabilities, and improving incident response strategies. She presented case studies demonstrating digital forensics in action, such as tracing the origin of a large-scale data breach. The Q&A session addressed questions on career opportunities, the impact of new technologies, and ethical considerations. Dr. Ankit Srivastava concluded the session with a vote of thanks, followed by a networking opportunity for attendees.

INTERNATIONAL CONFERENCE

MARCH 20-22, 2024





The three-day International Conference on Trends in Forensics, Law and Criminology: Empowering Criminal Justice in 21st Century and beyond buzzed with activity as experts from various disciplines convened to dissect pressing issues and ground-breaking advancements in the field. A central theme emerged – fostering collaboration across disciplines while ensuring ethical practices in the pursuit of justice.

The opening day unveiled a glimpse into the future with cutting-edge technology like Virtopsy, a virtual autopsy method poised to revolutionize traditional practices. Experts also tackled the sensitive issue of dignified treatment for victims in disaster zones and the importance of meticulous evidence preservation during investigations. The afternoon session shifted gears, tackling the complex issue of gender-based violence and women's reproductive health and the role of modern scientific research to counter this issue. Healthcare professionals shared their experiences navigating the ethical dilemmas they face, while discussions highlighted the challenges in securing legal access to safe abortion and the use of controversial techniques like narcoanalysis. Presentations explored the multifaceted nature of gender-based violence, encompassing marital rape, violence against transgender individuals, and domestic violence against men. Running concurrently, another session delved into the ever-evolving field of criminology in the modern era. The rise of cybercrime dominated discussions, alongside the increasing role of artificial intelligence (AI) in crime prevention and identification. The significance of DNA evidence as a cornerstone of criminal investigations was reaffirmed, while some proposed the concept of "Digital Justice" as a potential solution for certain violations. Experts grappled with the intriguing question of whether biological factors contribute to criminal behavior, considering the potential of biotechnology in addressing these root causes. Collaboration between criminology, law, and forensic science emerged as a critical element for achieving effective forensic justice. The importance of community involvement in forensic procedures and empowering victims through improved reporting mechanisms was also underscored.

Day two delved deeper, exploring advancements in behavioral forensics and digital investigation techniques. Disaster Victim Investigation (DVI) emerged as a crucial tool, offering a blend of behavioral analysis and technical identification in the aftermath of major catastrophes. Dr. Ranjit Singh's keynote address served as a powerful reminder of the synergy between these fields, emphasizing the vital role of forensic science in understanding and analyzing criminal behavior. The afternoon sessions plunged into the ever-evolving landscape of digital forensics. Experts addressed the crucial role of digital evidence in contemporary investigations, encompassing diverse areas like automobile forensics, AI-powered policing tools, and combating e-banking scams. The session also grappled with the challenges posed by deep-fakes, those unsettlingly realistic synthetic media creations, and the importance of robust printer identification techniques. The potential of AI and machine learning to enhance law enforcement capabilities was a recurring theme, with a strong emphasis on ethical considerations and responsible implementation.

Ethical considerations in forensic medicine and pathology were another key area of discussion. Sessions explored complex ethical dilemmas surrounding euthanasia, tracing the evolution of the concept and the legal landscape in India. The potential of AI in forensic odontology, the study of teeth and jaws, was also discussed, showcasing its ability to overcome human subjectivity and achieve greater accuracy in dental analysis. Forensic anthropology emerged as a valuable tool for identifying individuals in challenging cases, particularly where other identifying features are absent. Presentations also covered the role of medical experts in legal proceedings, age determination using 3D CT scans, and the social and legal implications of virtual autopsies. The conference didn't shy away from contemporary issues within law and criminal justice systems.





Challenges associated with using social media posts as evidence were explored, particularly the blurring lines between public and private online spheres. The session addressed sexual bribery within the Sri Lankan criminal justice system, emphasizing a multifaceted approach involving various stakeholders. The importance of forensic science in protecting child witnesses in the Philippines was highlighted, underscoring the necessity for child-friendly environments and specially trained professionals. Paper presentations covered witness protection schemes, the concept of "e-prisons" and its potential to revolutionize digital prison management, and the impact of One-Stop Centres in supporting victims of violence against women. The role of forensic evidence in bail proceedings for under-trial prisoners was also explored, alongside the potential of crime trend profiling for proactive policing and effective crime prevention. The session concluded by examining the extent of legal liability for administrators of social media groups. During the evening hour, one round table discussion was carried out between eminent individuals present in this conference about the recent Law reforms in India and how Science and Technology affected the major changes. This session also discussed around different upcoming implications and issues related to these reforms in the near future.The final day showcased the multifaceted world of forensic science in the 21st century, emphasizing both established practices and emerging trends. A central theme was the power of DNA analysis. Prof. (Dr.) Gyaneshwer Chaubey's presentation explored Ancestry Informative Markers (AIMs) and their potential to reveal ancestral origins and identify victims of historical crimes. Dr. Mukesh Thakur highlighted DNA forensics in combating global wildlife crime, showcasing its use in identifying wildlife products like ivory and aiding in conservation efforts. Dr. Jay Dalet introduced fluorescent nucleic acid probes for body fluid identification and RNA/DNA-based technologies, showcasing how targeted analysis of specific cell types can strengthen forensic investigations.

Across the three-day event, approximately 300 persons have participated including, One keynote speaker, two Plenary Speakers, 24 Senior Scientists, 42 Young Scientists, 41 Research Scholars, 82 Post Graduate students and 54 Undergraduate students.

Key Publications

Srivastava *et al.*
Egyptian Journal of Forensic Sciences (2022) 12:51
https://doi.org/10.1186/s41935-022-00309-y

Egyptian Journal of Forensic Sciences

REVIEW Open Access

Impact of DNA evidence in criminal justice system: Indian legislative perspectives

Ankit Srivastava[1*], Abhimanyu Harshey[2], Tanurup Das[1], Akash Kumar[2], Murali Manohar Yadav[3] and Pankaj Shrivastava[4]

Abstract

Background: The scientific and technological advances along with the changing socio-economical standards of society have posed new challenges to the criminal justice system. With the changes in society and technology, there is also an increase in crime rate. Forensics provides the scientific proofs beyond the shadow of reasonable doubt and thus significantly contributes in criminal as well as civil investigations and legal matters.

Main body of the abstract: Discovery of DNA has opened new avenues and the advancement of DNA technology and its introduction into the court of law has provided extensive aid in the resolution of civil and criminal disputes. In India, the DNA technology was first introduced in a paternity dispute in 1989. However, the need for legislation and guidelines to support grounds for the use of DNA profiling for forensic purposes in India has been recognized for some time now. In July 2019, the DNA Technology (Use and Application) Bill 2019 was introduced in the Indian parliament.

Short conclusion: Herein, this article is focused on the current aspects of DNA based evidence in the Indian Criminal Justice system along with the associated issues, highlighting the need for specific DNA based legislation.

Keywords: Criminal justice system, Forensics, DNA technology, DNA technology (Use and Application) bill 2019

Background

Advances in scientific technology have brought revolutionary changes in people's life. Along with the positive aspect of these changes in the lifestyle and facilities, these advancements have posed a problem for the law enforcement agencies to prevent the misuse of the technology by criminals to commit an offence. The scientific analysis of the exhibits provides substantial scientific evidence. The application of science for the criminal investigation is termed as Forensic Science. These technological advances in the criminal justice system (CJS). As evident from the previously published literature, many persons were protected from being convicted by using forensics who were wrongly suspected or accused (Jayewardene 1988; Brown 1998; Sedley 2005). Based on these studies and cases, it should not be ignored that this advanced technology could not be implemented without affecting the conventional legal principles for the betterment of judicial system. It is still an issue of debate as how to optimally use the technological advances and how much is the need

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REVIEW

Focusing the intervention of paper-based microfluidic devices for the forensic investigative purposes

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Abstract

It is a well-established fact that legally sound evidences are required to prove or disprove any criminal activity. When a particular activity occurs, it leaves a trace out of mutual contact and failure to detect that trace proves the activity did not occur. To enhance the capabilities of the justice system in evaluating evidence, researchers are continuously engaged in the development of novel analytical techniques which provide scientific methodologies for effectively assessing and interpreting the evidence associated with criminal activities. Among the several devices available, paper-based microanalytical devices (μPADs) have attracted the interest of forensic scientists/experts in recent years. These devices are designed with microchannels to which dedicated reagents are added for promoting selective reactions. As a result, they offer a practical and convenient solution for on-site detection of physical evidence, providing ready-to-use capabilities for forensic investigations. This does not only help the investigators in collection of legally sound evidences but also open avenues in apprehending the potential offender who might be present in the scene by detecting the traces. μPADs are inexpensive, simpler to operate, require less chemical consumption, portable, and provides results visible to naked eye. Furthermore, with the aid of digital scoring of color intensity, semi-quantitative results can be generated. This review explains current state of applications and operating chemistry of μPADs involved in analysis of evidences of forensic interest such as explosives, gunshot residue, drugs of abuse, pesticides, body fluids, and estimation of time since death. Furthermore, the research gaps in the domain and viability of future trends for the application of μPADs in forensic science are also presented.

Keywords Paper-based microfluidic devices · Forensics · Trace evidence · Gunshot residue · Explosive · Drugs · Pesticide · Time since death

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Original Research Paper

Assessment of Variations in Pollen Profiles of Soil and Cloth Samples from two different Regions of Delhi and their Comparison with Reference Data of Bundelkhand Region

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ABSTRACT :

Introduction : Pollen grains can be a good crime scene marker in various types of forensic investigations. Despite various possible sources, soil and cloth are frequently encountered samples as pollen sources in forensic cases.

Aims and objective: This work aims to examine the variations in pollen profiles isolated from different soil and cloth samples that were collected from two different vegetation areas of Delhi. A secondary objective of this study is to identify different pollen grains according to their Pollen aperture and Pollen polarity and database preparation of two different geographical sites in the Bundelkhand region i.e., Jhansi and Orai.

Materials and Methods: Samples were collected from two different geographical sites of Delhi (North-west Delhi, East Delhi) and Bundelkhand (Jhansi, Orai) regions in India. The soil samples were collected from the earth to one-inch depth in clean polythene bags, properly marked, and sealed. The cloth samples (size 12cm X 12cm) were simulated as crime scene samples at the same distance (localized areas) in both the areas. Isolation of pollen species from the soil samples was performed using the established approaches in the domain.

Results: A careful examination of pollen species and their percentage of occurrence in the samples collected from the Delhi region shows their distinct profiles in different areas, signifying their importance as a forensic tracer. Different methods of isolating pollen grains from cloth samples are also compared and a modified method is suggested for further forensic use. A pollen database of commonly present pollen species was prepared from the Bundelkhand region, Uttar Pradesh, India.

Conclusion: Differences in pollen profiles of different regions under investigation can be used as important evidence by the

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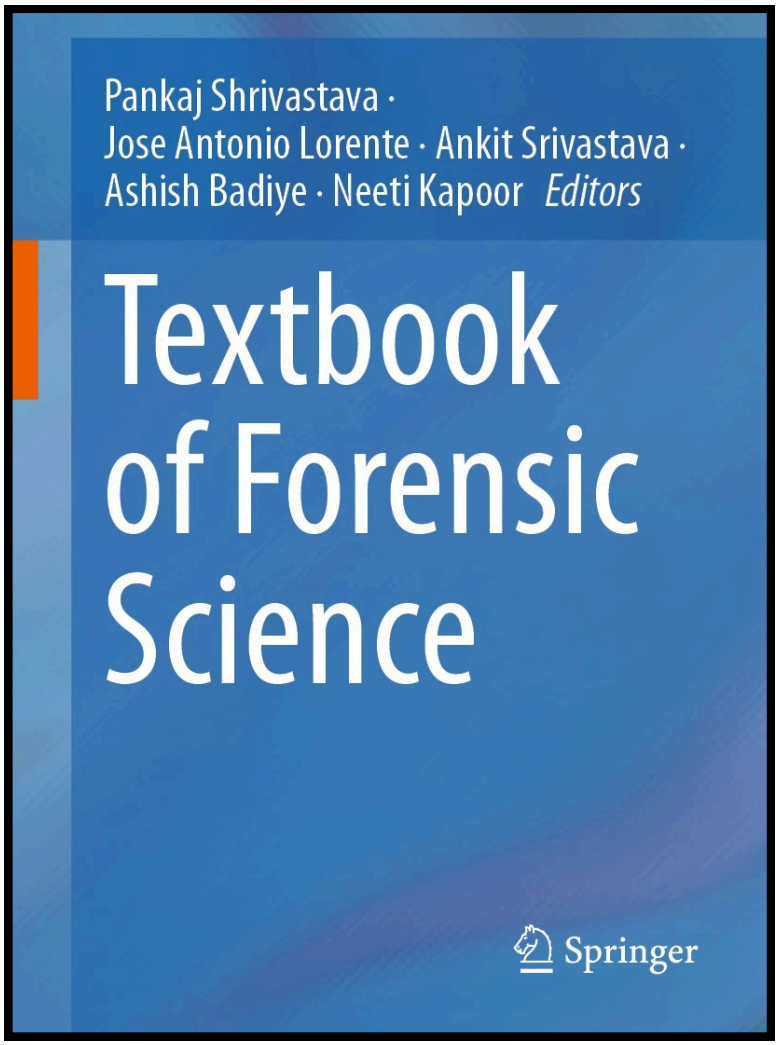
ORIGINAL RESEARCH PAPER

Forensic investigation of fracture pattern on automobile laminated glass windshields made by mechanically propelled projectile

Abhimanyu Harshey · Kailash Singh Negi · Sughosh Abhyankar · Tanurup Das · Md. Alim · Ankit Srivastava

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Abstract Any physical evidence supported by scientific proofs provides information of evidential importance. Automobile laminated glass has been considered as one of the primary and most important evidence at various crime scenes such as hit and run, shooting. Analysis of fractured windshields is therefore of distinguished forensic importance. In the presented study, shooting incident was simulated using 0.22″ (5.5 mm) evaluated the consistency in characteristics and categorical differences were evident in *t*-test. These findings could be implicated for understanding different shooting-related crime scenes which involve laminated glasses. This approach holds promising forensic relevance. Characterization of fractured windshield might provide an investigative lead to determine the cause of fracture, type of weapon used, range of fire, etc.





Hon’ble Vice Chancellor Prof. (Dr.) Nirmal Kanti Chakrabarti with Hon’ble Justice Ashim Kumar Roy, Lokayukta, West Bengal during Inaugural Session of ICTFLC-2024







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