Forensic Hackathon 2023

01 - 02 February 2023

Organized By
National Forensic Sciences University

In Association With
Directorate of Forensic Science Services

Patronized By
Ministry of Home Affairs, Govt. of India

ABOUT NATIONAL FORENSIC SCIENCES UNIVERSITY (NFSU)

National Forensic Sciences University (erstwhile Gujarat Forensic Sciences University) was established by the Government of India through Act, 2020 (32 of 2020) on 1st October 2020 and also accorded the status of an "Institution of National Importance". Established under the aegis of the Ministry of Home Affairs, Govt. of India, the objective of NFSU is to promote forensic science in conjunction with applied behavioural science, law, criminology, and other allied areas and technologies. University has headquarter located at Gandhinagar, Gujarat and other campuses at Delhi, Goa, Tripura, and Bhopal along with academies at Pune, Guwahati, and Manipur. Through thirteen Schools, nine Centres of Excellence, and state-of-the-art infrastructures, NFSU is producing skilled human resources for the different domains of forensic investigation and promoting research and innovation. Being as world's first and only forensic university, NFSU is also providing consultancies and imparting training to different stakeholders of the criminal justice delivery system thus strengthening the forensic capabilities globally.

ABOUT DIRECTORATE OF FORENSIC SCIENCE SERVICES (DFSS)

The DFSS is a nodal organization of the Ministry of Home Affairs, Govt. of India to propagate and carry out best forensic science practices in the country to serve the cause of the criminal justice delivery system. It has been established in the year 2002 on bifurcation from the BPR&D, New Delhi. The motto of the organization is to provide: High Quality, on-time, and Credible Forensic Services to the nation. The Directorate of Forensic Science formulates plans and policies to promote forensic science services and to regulate the same. The Directorate also provides services to various Law Enforcement agencies of Central and State through its well-established Central Forensic Science Laboratories at Kolkata, Hyderabad, Chandigarh, Pune, Bhopal, and Guwahati.

THE CHALLENGES

With the increase in criminal activities and the use of advanced modus operandi by criminals, there is an urgent need to strengthen the criminal justice delivery system through forensic investigation. Rapid and accurate forensic investigation helps the police and judiciary for quicker disposal of criminal cases. According to recent reports published by National Crime Records Bureau, the conviction rate in different criminal activities is about 57% .

Following majors can improve the criminal justice delivery system across India:

1. Improving Investigative infrastructure

2. Training of human resource in forensic investigation particularly for crime scene investigation

3. Proper training of handling and analysis of evidences

4. Supporting research and development in forensic and allied sciences

5. Supporting and promoting indigenous tools and techniques as a make in India initiative

Forensic Hackathon 2023

ABOUT FORENSIC HACKATHON 2023

India is now ranked among the top three start-up-friendly ecosystems in the world. Programs like Atal Innovation Mission, PM Research Fellowships, Start-up India Abhiyaan, Aatmanirbhar Bharat, SAMRIDHI scheme etc. are the foundations to establish India as a global epicentre of innovation. To support, the 'Make in India' policy of the Government of India, National Forensic Sciences University in collaboration with the Directorate of Forensic Science Services (DFSS) and under the patronage of the Ministry of Home Affairs, Govt. of India is organizing Forensic Hackathon on 1st-2nd February 2023.

The aim of this Forensic Hackathon is to make a positive impact on crime investigation. This event will create competitive spirits and collaborative efforts amongst all the stake holders which include Central/State Forensic Science Laboratories, institutions and industries engaged in the analysis and manufacturing of forensic tools. Through this event, all the stake holders will come together with the following intents:

- Create feasible, viable and simplified solutions that could help police, judiciary and forensic scientists to use science and technology for crime investigation.
- Discussion on new ideas that connect the scientific methods of crime investigation including forensic investigation in an effective and valuable way for justice delivery system.
- Create solutions that address the need to keep crime investigation cost effective.
- Conversion of ideas which could be translated into manufacturing of forensic tools in India.

This national-level hackathon will bring young and bright minds together to solve the issues related to criminal investigations based on forensic expertise. They will get expert guidance and assistance from forensic and technical professionals. The solutions found in the Forensic Hackathon may be translated into start-ups for future.

OBJECTIVES OF FORENSIC HACKATHON 2023

- To understand the real time problems/challenges faced by Central and State Forensic Science experts and other law enforcement agencies during scientific investigations of crimes.
- To find the innovative solution which may produce next generation methodologies or products that could help in the crime investigation of heinous crimes like sexual assault.
- To identify companies/startups which are interested in manufacturing tools and technologies related to forensic investigation.
- To encourage the competitive spirit among the students of eminent institutes / universities or colleges to translate their ideas/product into indigenous tool for criminal investigation

NO REGISTRATION FEES

REGISTRATION LINK
www.nfsu.ac.in/hackathon

MAJOR THEMES

FORENSIC PHYSICAL SCIENCES (Physics, Ballistics)

I. Development of device for collection and detection of Fumes and Vapours produced by inflammable substances.

II. Determination of Age of Ink.

III. Determination of Sequence of Strokes Automatic identification of signatures/handwriting.

IV. Examination of digitally manipulated and machine generated document.

V. Computerized technique for identification of fired ammunition with respect to Fire Arms and creation of database.

VI. 3D Forensic Facial Reconstruction.

VII. Tools for Preventive Forensics.

FORENSIC CHEMICAL SCIENCES
(Chemistry, Explosive, Toxicology, Narcotics)

I. Development of Software for determination of geographic origin of drugs of abuse based on intermediate reaction reagents & adulterants residues.

II. Method development for analysis of animal poisons in biological samples.

III. Development of standards for narcotic drugs.

IV. Development of android based image processing mobile application for automatic quantification of Thin Layer Chromatography spots.

FORENSIC BIOLOGICAL SCIENCES
(Serology & DNA)

I. On the spot identification of source of biological fluids (saliva, semen, urine etc.)

II. Exact age estimation of a person.

III. Predicting suitability of bones for DNA profiling.

IV. Development of kits for age estimation of biological fluids for forensic application.

V. Development of X-STR/Y-STR/Autosomal Kits indigenously.

VI. Hand held normal PCR or Real time PCR.

VII. Development of cost effective and reliable instruments particularly for crime against women.

FORENSICS ELECTRONICS
(Cyber/Computer Forensics, Mobile Forensics, Multimedia Forensics)

I. Development of software for recovery of overwritten/deleted files from CCTV/DVR/Hard Disk.

II. Reconstruction of corrupt/bad sector video files retrieved from CCTV/DVR. Enhancement of CCTV Footage.

III. Computerized approach for decrypting data from encrypted disk partition.

IV. Recovery of previous user data from factory reset phones and formatted flash memory.

V. Decryption of WhatsApp database files. retrieved from phone memory.

VI. Development of software for authentication of audio-video footage.

VII. Drone Forensic Tools.

FORENSIC PSYCHOLOGY

I. Neuro-Psycho-Behavioral profiling of criminals Assessment of criminal behavior and its future predictability.

II. Police/Army Psychology: Recruitment, their stress management and intervention.

III. Rehabilitation modules for Juveniles.

IV. Prison Psychology: Development of Counseling, intervention, coping skills and improving subjective well-being training and rehabilitation program for prisoners/Jailor/relatives of prisoners.

V. Psychological Challenges in Schools/Colleges: For prediction of violent behavior among students, suicidal tendencies, bullying in children.

VI. Challenges for NGOs: Counselling and to develop rehabilitative modules for victims of domestic violence and rape, child rights, child custody, divorce cases etc.

MEDICO-LEGAL STUDIES

I. Establishing Time since death

II. Establishing the difference between antemortem and postmortem with reference to asphyxial death.

III. Identification of unclaimed/unidentified bodies with reference to molecular fingerprints.

IV. Artificial intelligence based identification system in case of mass fatalities.

V. Artificial intelligence based Anthropological data analysis in suspected criminals with special reference to social demography and socio cultural parameters-facial muscles and voluntary muscles.

VI. Exoskeleton study for developing geomarkers.

VII. Quick detection of occupational hazardous materials.

Above mentioned topics are broad and not exclusive in nature. Any technology which helps in the crime investigation and crime prevention can be included in the list.

Forensic Hackathon 2023

WHO CAN PARTICIPATE?

- Students of Universities/Colleges from all over India.
- Technocrats, Academicians, Scientists, Police, Judiciary
- Industry partners especially Indian manufacturing companies
- Potential entrepreneurs
- Startups

TEAM COMPOSITION

- Maximum three (3) members in a team.
- Each team should include currently enrolled students in an educational institution in India (student ID numbers and a copy of ID must be provided for validation).
- In case of professional, team should incorporate currently associated persons in Government or private organizations/industries/start-ups of India.

EMINENT INVITEES / SPEAKERS

- Judges
- Senior Police Officers
- Forensic Investigators (All Directors of CFSLs and State FSLs)
- Academicians and Scientists
- Industry Professionals
- Founders or proficient employees of forensic startups and reputed companies

BENEFITS TO THE PARTICIPATING COMPANIES

- Identifying new domains of forensic sciences to explore their business.
- Getting new ideas to develop new tools and techniques.
- Identifying talented human resource for their organization.
- Hackathon will help to establish networks among students, investigators, forensic scientists and experts, law enforcement agencies and professionals.
- A novel method to enhance the market potential and get their brand out there to innovative, tech-savvy people in their area.

INTELLECTUAL PROPERTY

The intellectual property of the team members' will belong to the participants or jointly as applicable. The proposed relevant forensic technology should be indigenously developed, which could be effectively used in the field of Forensic Science. However, more emphasis will be given to those technologies which gives advanced information that is not available currently. These "cutting-edged" technologies will be thoroughly vetted to ensure that they become accepted by leaders in the concerned field.

IMPORTANT DATES

20 December 2022	02 January 2023	01-02 February 2023
Last Date of Registration	Acceptance of Proposal	Forensic Hackathon

EVALUATION PROCESS DETAILS

Basic Criteria: The Judges will score eligible submissions using the following equally weighted criteria (the "Judging Criteria"):

(i)   Relevant, feasible and applicable solution to the problem related to forensic science
(ii) Quality of the Idea (Indicating creativity, originality and the potential to significantly improve criminal investigation / justice delivery process.)
(iii) Value to enterprise (demonstrating the usefulness to law enforcement agencies, such as streamlining or automating investigation operations, reducing cost, efforts, response times, complications and improving the effectiveness of existing security tools.)
(iv) Technical implementation (assessing how well the idea was executed by the participants, including the user experience, the complexity of the technology or process or scenarios and whether it performs as expected)

A detailed rubric for the evaluation and the presentation format will be communicated to the selected teams after the screening.

SCREENING

- **After initial screening, 15 participants/teams per theme will be selected for the final event.**

PRIZES FOR THE BEST PRODUCT / INSTRUMENT DEVELOPMENT:

WINNER
₹ 5 lakh

RUNNER-UP
₹ 3 lakh

Innovate   Incubate   Compete   Collaborate

FINAL PRESENTATION

Each team has to give a final presentation of 10 minutes. This will also include questions and answers session. The participants are encouraged to address three main aspects in their presentation mentioned below:

- The problem being addressed and its importance
- New solution or technology being offered
- The business model that accompanies it

OUTCOME OF THE FORENSIC HACKATHON 2023

- Boost-up the research and development in the domain of Forensic Sciences
- Exchange of ideas among the students, forensic scientists, industry professionals, academicians and law enforcement authorities
- Conversion of ideas which could be translated into manufacturing of forensic tools in India

LOGISTICS

The logistic facilities for hackathon such as food, local transportation, local hospitalities and AV needs (video, photography, microphones, speakers, projectors, display adapters, power cabel for each table), WIFI, access to forensic science laboratories will be provided by the NFSU. Any other specific requirements for hackathon should be carried by the participating teams.

Innovate   Incubate   Compete   Collaborate

ORGANIZING COMMITTEE

PATRON IN CHIEF

Dr. J. M. Vyas
(Padma Shri Awardee)
Hon'ble Vice Chancellor, NFSU

PATRON

Dr. S. K. Jain
Chief Forensic Scientist & Director
Directorate of Forensic Science Services, New Delhi

Prof. (Dr.) S. O. Junare
Campus Director, NFSU, Delhi Campus

CHAIRMAN ORGANIZING COMMITTEE

Prof. (Dr.) Purvi Pokhariyal
Campus Director, NFSU, Gandhinagar Campus

ORGANIZING SECRETARY

Prof. (Dr.) Satish Kumar
Dean, School of Forensic Science, NFSU

VENUE

National Forensic Sciences University
Knowledge | Wisdom | Fulfilment
An Institution of National Importance
(Ministry of Home Affairs, Government of India)

NATIONAL FORENSIC SCIENCES UNIVERSITY
Sector 9, Gandhinagar-382007, Gujarat, India.
www.nfsu.ac.in/hackathon
hackathon@nfsu.ac.in

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