IASR

INTERNATIONAL ASSOCIATION
OF SCIENTISTS & RESEARCHERS

eConference
Proceedings

24th-25th
April 2021

4th INTERNATIONAL eCONFERENCE-2021

Fingerprint Analysis

Supported by

S F S INDIA
Sherlock Institute of Forensic Science India

GREETINGS FROM THE ORGANIZING DESK

The new era post the global pandemic has affected academics, establishments, and individuals' preparedness worldwide. Forensic Science has an interdisciplinary approach and its true essence can be proved meaningful with collaborative efforts of people present around the globe functioning together as a team. With a vision to bring all the academicians, students, and professionals and share their valuable contemplations, the 4th International eConference is structured to lead the way through endeavors focused to take Forensic to greater heights. We welcome every science enthusiast to become a part of this revolutionizing effort and explore the technological advancements, scientific researches, and opportunities for everyone to flourish.

Dr. Ranjeet Kr. Singh
President
International Association
Of Scientists and Researchers

Phaneendar B N
Forensic Expert, CEO
Clue4 Evidence Foundation

THE ORGANIZER

INTERNATIONAL ASSOCIATION OF SCIENTISTS AND RESEARCHERS (IASR)

IASR is a non-profit organization focused to deliver the updated literature and research work to not only the global scientific and research society, but also to everyone. Providing open access to critically reviewed high-quality research papers and literature, it works with a mission of providing a user- friendly global platforms for researchers, scientists for sharing information, and dissemination of recent ground breaking researches and advancements in various fields working together for the betterment of the world.

About the eConference

Forensic Science has proffered techniques that have leveled up the competence of humankind and are staying up with the trend. At the outset, the International Association of Scientists and Researchers (IASR) in association with the Sherlock Institute of Forensic Science (SIFS) India organizing the 4th International eConference on "Fingerprint Analysis", 2021. With utmost enthusiasm, the organizing committee invites the young minds and professionals of various disciplines of forensic science and become a part of the first-ever convention organized with the motto of bringing the unrecognized talents, present globally. The program would follow talks by eminent national and international experts accompanied by e-paper presentations, ePoster presentations, discussions, and scientific excellence awards.

Mission Statement

"Committing towards the fact of being a lead-follower of technology with a bold spirit of risk-taking, helping us make our presence noticeable worldwide".

Fingerprint Analysis

SPEAKER'S PROFILE

SHANE TURNIDGE

Fingerprint Expert
SST Forensics, Canada

Fingerprint expert Shane Turnidge has been part of the forensic identification landscape in Canada for more than thirty years. Since retiring from public service, he has owned and operated an independent expert fingerprint and palm print consultancy, SSTForensics. His knowledge, skills, and experience were gained while working for both the Peel Regional Police and the Toronto Police Service in their respective Automated Fingerprint Identification System (AFIS) sections. He was also certified to search and save both latent fingerprint and latent palm print records on the RCMP AFIS database in Ottawa. As an author, he has been published in several peer-reviewed journals on several topics.

JOHN PATRICK MOLONEY

Director
Forensic Comparison Software, Australia

John Patrick Moloney was employed in 2008 as a consultant by the Australian Department of Immigration to introduce Fingerprint identification in to Immigration Processing. Achievement's include the integration of Australian Immigration Fingerprint database with Australia's National Fingerprint system NAFIS. As the manager of the Australian Federal Police Fingerprint Section, he adopted work practices that best equipped the Fingerprint team for the digital environment. He was appointed as Officer in Charge of the Northern Territory of Australia Fingerprint Section in 1998. Major achievements include the introduction of digital cameras for the capture of latent fingerprints at crime scenes and the introduction of Livescan for the capture of offender fingerprints.

Fingerprint **Analysis**
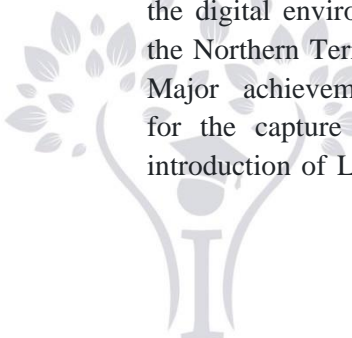
SPEAKER'S PROFILE

DR. NEETI KAPOOR

Assistant Professor,
Government Institute of Forensic Science, Nagpur, India

Dr. Neeti Kapoor is an Assistant Professor since 2012 at the Government Institute of Forensic Science, Nagpur. She has 28 international research paper publications and five international chapters to her credit. She is a recognized reviewer for over ten journals from reputed publishers such as Elsevier, Springer Nature, Routledge-Taylor & Francis, SAGE, and PLOS. She has delivered over 50 guest lectures and practical demonstrations on various aspects of Forensic Science to the Police Officers of Nagpur City Police, Bhandara District Police, Chandrapur District Police, Nagpur Rural under the Special IG Office Nagpur Range under In-Service training program, etc. She has been awarded Special Recognition for their contribution to "Scientific Aid to Investigation" by Nagpur City Police Commissioner in 2017, 2018, 2019.

HEENA GOSWAMI

Assistant Professor
Gujarat National Law University, Gujarat, India

Heena Goswami is currently serving as Dean of Extension and Capacity Building & Assistant Professor of Science & Technology. She has associated with Gujarat National Law University and having research experience working with Regional Forensic Science Laboratory, Junagadh. She has actively investigated multiple crime scenes like murder, hanging suicide, poisoning, motor vehicle accidents, etc. She is also an editorial member of Science technology and Law: Contemporary Issues in Biotechnology. She has actively involved in SSIP Annual International Conference organized by EDII and participated in 24th All India Forensic Conference jointly organized by the Directorate of Forensic Science. She has numerous certifications under the name form International Taxation, Certificate course on Air and Space Law.

Fingerprint Analysis
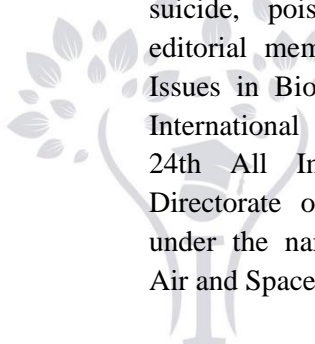
SPEAKER'S PROFILE

MOHAMED ALSUWAIDI

Fingerprint Chemical Development Examiner
**Dubai Police, UAE**

Mohamed Alsuwaidi is currently working as a Fingerprint Chemical Development Examiner since 2013 and also he is working with ISO Standards in Chemical Development Section since 2016. He graduated from the UK Undergraduate from the University of South Wales in Forensic Science and holds a master in instrumental analysis from the University of Central Lancashire. He also did a Diploma in Fingerprint from Ron Smith & Associates, Inc. In 2019, he completed his training from the USA FBI team in Forensic Photography. In 2017, he was trained to use the forensic scoop and in 2018, he was trained to use EVI scan. He was a member of the Dubai police scientist council (2017-2018). He has a membership in the International Association of Identification (IAI).

ANDREW REITNAUER

Forensic Consultant
Delta Forensics, USA

Andrew Reitnauer is currently serving as the Technical Lead Scientist for the Washington DC Department of Forensic Sciences, Latent Fingerprint Unit, and previously served as a Shift Supervisor for the Crime Scene Services Section, as well as being the owner of Delta Forensics, LLC, a forensic science consulting and training company. He is also an ASCLD/LAB approved internal auditor for laboratory standards. He is an initial member of the Friction Ridge Subcommittee of the OSAC through NIST. He is an expert witness examiner and testimony, trainer of several topics and 20+ class sessions, senior Crime Scene Responder since 2006, Forensic Photographer and a Certified Senior Crime Scene Analyst (CSCSA) with the IAI.

Fingerprint Analysis
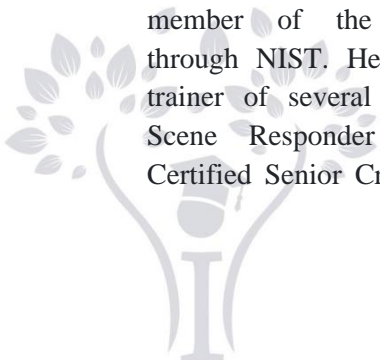
SPEAKER'S PROFILE

DUVAY HERNANDO BERRIO BERNAL

Forensic Instructor - Investigator - C.S.I.
Institute of Criminal Law and Criminal Sciences, Bogota

Duvay H. Berrio is the Fingerprint Examiner and Crime Scene Investigation Expert. He has an experience of 15 years in the field of Forensic Science. He worked as Legal Assistant, Criminologist Researcher, Fingerprint Examiner, Document Examiner, Biometric expert etc. He worked at National Agency of Investigators and Experts, Colombia, Bogota D.C. In 2005, he worked at Fingerfile Forensic Science Labs, Bogota D.C. He is also giving his contributions in teaching at Sergio Arboleda University. He has numerous publications under his name in various National and International journals.

DR. G. S. SODHI

Associate Professor,
SGTB Khalsa College, University of Delhi, India

Dr. G.S. Sodhi earned his Ph.D. degree from Delhi University and at present is an Associate Professor in Chemistry and Forensic Science at the S.G.T.B. Khalsa College, Delhi University. He has published 100 research papers and filed 10 Indian patents. He was Visiting Fellow, National Crime Records Bureau, Ministry of Home Affairs, New Delhi during 1996-97. He has successfully completed 10 research projects, sanctioned by the University Grants Commission, Department of Science and Technology, Indian National Science Academy, and the University of Delhi. He received Union Home Minister Award; National Technology Day Award; National Search for Innovation Award; Lockheed Martin India Innovation Award; and India Innovation Initiative Award for innovative work in forensic science. His book entitled Indian Civilization and the Science of Fingerprinting was published by the Publication Division, Ministry of Information and Broadcasting, Government of India in 2013. He is a Member of the International Fingerprint Research Group, Jerusalem. He has organized several symposia and training courses in forensic science for students, teachers, army officers, and Indian and overseas police personnel.

Fingerprint Analysis
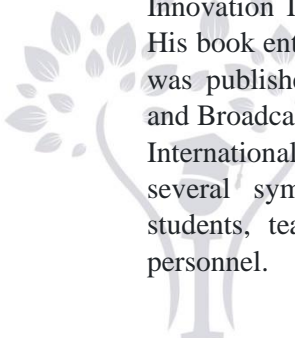
SPEAKER'S PROFILE

DR. KANCHANA KOHOMBANGE

Director,
International Hand Analyzing Consultancy, Sri Lanka

Dr. Kanchana is currently working as the Director of International Hand Analyzing Consultancy, has been conferred Research Doctorate from an International Open University in Kolkata, India. She owns the Largest Fingerprint Database in Sri Lanka and has about 12 years of research experience. She has undergone training in "Finger Print Science in Law Enforcement" at the Central Finger Print Bureau of National Crime Records Bureau (An Accreditation body for Finger Print Experts in India) New Delhi, India, and secured 1st position. She has studied forensic science and criminal investigation from Atma Ram Sanatan Dharma College, University of Delhi. The most common studies she has made so far is medical palmistry, scientific hand analysis, gestures, and identification of personality through hand analysis. Under these categories, she has already published many research papers in the national and international journals of repute. She is a growing researcher and writer for a period.

PUDJI HARDJANTO

Republic Indonesia Police Officer
Crime Unit, Surabaya, Indonesia

Pudji Hardjanto is currently working as a Republic Indonesia Police Officer at Crime Unit in Surabaya. He completed a Bachelor of Law in the year 2008 and Masters in Forensic Science in the year 2019 from the University of Airlangga. He has been trained in several Crime Scene Investigation training like CSI with NCIS (Naval Criminal Investigative Service) in 2008, CSI, Anti-Terrorism Assistance Programme with USA ATA in the year 2014. He also completed numerous Disaster Victim Identification courses such as Competency Enhancement on DVI Technic and Management (2017), DVI and Mortuary Management Course (2018), and DVI and Mortuary Management Course, JCLEC Semarang (2019).

Fingerprint Analysis

Supported by
SIFS INDIA
Sherlock Institute of Forensic Science India
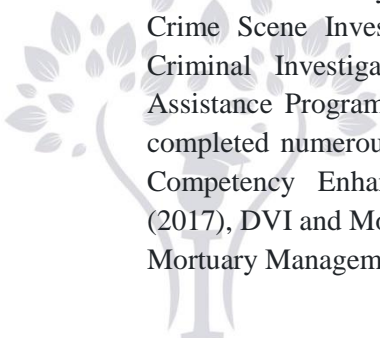
4th INTERNATIONAL eCONFERENCE-2021

Day 1: 24th April 2021

Time	Topic	Keynote Speaker
10:30 to 11:00 AM IST	Friction Ridge Analysis, a Return to Science	Shane Turnidge
11:00 to 11:30 AM IST	The Future of Fingerprint Analysis	John Patrick Moloney
11:30 to 12:00 PM IST	Fingerprint Examination: An Aid to investigation	Dr. Neeti Kapoor
12:00 to 12:30 PM IST	Demystifying the Role of Fingerprint Science in Justice Delivery System	Heena Goswami
12:30 to 01:00 PM IST	Synthesis of Fingerprint Powder using waste and Low cost Materials	Mohammed Al Suwaidi

Day 2: 25th April 2021

Time	Topic	Keynote Speaker
10:30 to 11:00 AM IST	Latent Print Development: Blood Impressions	Andrew Reitnauer
11:00 to 11:30 AM IST	Comparison and Analysis of the Third Level in Fingerprints Developed and Located on the Transplant Tape	Duvay Hernando Berrio Bernal
11:30 to 12:00 PM IST	Advances in Chemical Development of Latent Fingerprints	Dr. GS Sodhi
12:00 to 12:30 PM IST	The significance of Fingerprints and Dermatoglyphics	Dr. Kanchana Kohombange
12:30 to 01:15 PM IST	Challenges in Fingerprint Analysis by INAFIS	Mr. Pudji Hardjanto

Fingerprint Analysis

Chairing Panel Day-1

Chairperson

Dr. Raju Tandan
B. T. Institute of Excellence, Sagar

Chairperson

Dr. Anu Singla
Dr. A.P.J. Abdul Kalam Institute of
Forensic Science & Criminology,
Bundelkhand University, Jhansi

Chairperson

Dr. Ashutosh Tripathi
SAGE Institute of Sciences,
SAGE University, Indore

Chairperson

Dr. Anurekha Yadav
Forensic Science Laboratory,
M.P.

Chairing Panel Day-2

Chairperson

Hemanta Kumar Panda
Retd. Fingerprint Expert
Bhubaneswar, Odisha

Chairperson

Dr. Kavita Sharma
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Chairperson

Dr. Vijay R Chourey
Government Holkar (Model Autonomous)
Science College, Indore

Chairperson

Dr. Swati Dubey Mishra
Shri Vaishnav Vidyapeeth
Vishwavidyalaya, Indore

Fingerprint Analysis

Supported by

S F S INDIA
Sherlock Institute of Forensic Science India

Chairperson for Scientific Presentations Day-1

PROFESSIONAL CATEGORY
PAPER PRESENTATION

Chairperson

Dr. Bhoopesh Kr. Sharma
SGT University,
Gurugram

Chairperson

Dr. Amarnath Mishra
Amity University,
Noida

PROFESSIONAL CATEGORY
ePOSTER PRESENTATION

Chairperson for Scientific Presentations Day-2

STUDENT CATEGORY
PAPER PRESENTATION

Chairperson

Dr. Richa Rohatgi
Amity University,
Gurugram

Chairperson

Dr. Rajeev Kumar
Galgotias University,
Greater Noida

STUDENT CATEGORY
ePOSTER PRESENTATION

Fingerprint Analysis

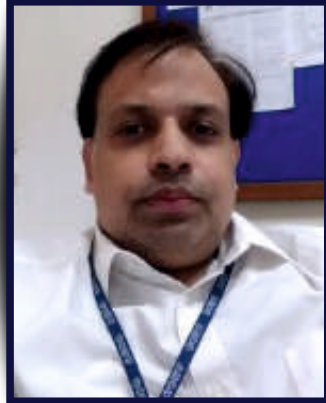Supported by
Sherlock Institute of Forensic Science India

PROFESSIONAL CATEGORY

JURY MEMBERS FOR PAPER PRESENTATION

Dr. Gagandeep Singh
CRC Press, Taylor & Francis Group Patiala

Dr. Prashant Agrawal
College of Traffic Management, IRTE, Faridabad (MDU Affiliated)

Dr. Kapil Kumar
Department of Forensic Science, Gujarat University, Ahmedabad

Dr. Manavpreet Kaur
Wikimedia Foundation Punjab

JURY MEMBERS FOR ePOSTER PRESENTATION

Dr. Preeti Singh
National Post Graduate Autonomous College Lucknow

Dr. Richa Rohatgi
Amity University, Gurugram

Dr. Neeharika Srivastava
GD Goenka University, Gurugram

Mebin Wilson Thomas
JAIN (Deemed-to- be University) Bengaluru

Fingerprint Analysis

Supported by
SIFS INDIA
Sherlock Institute of Forensic Science India

STUDENT CATEGORY

JURY MEMBERS FOR PAPER PRESENTATION

V B Kashyap

Fingerprint Expert, Haryana

Vinny Sharma

Galgotias University, Greater Noida

Dr. Rohit Srivastava

Forensic Science Dept., College of Life Science, CHRI Campus, Gwalior

R Aparna

Jain (Deemed-to-be University), Bengaluru

JURY MEMBERS FOR ePOSTER PRESENTATION

Dr. Shweta Sharma

Rashtriya Raksha University, Gujrat

Pallavi Mallik Chopra

Forensic Science Laboratory, Mohali

R.S. Sathish Kumar

Sub-inspector of Police, Fingerprint Expert, Andhra Pradesh

Varsha Singh

Centurion University, Odisha

Fingerprint Analysis

IASR Advisory Board

Dr. HARSH SHARMA
Retd. Director, State Forensic
Science Laboratory, M.P.

JOHN PAUL OSBORN
Osborn & Son
New Jersey

Dr. EDDY De VALCK
Academy of Forensic Medical
Sciences, Belgium

Dr. ROBERT GREEN
University of Kent
England

MICHAEL WAKSHULL
Q9 Consulting, Inc.
California

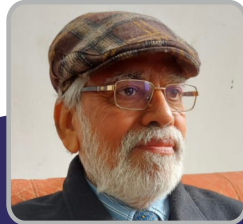**Prof. EMILIO NUZZOLESE**
University of Turin,
Italy

MICHAEL W. STREED
SketchCop Solutions Inc.
California

Dr. RAJINDER SINGH
(Former) Central Forensic Science
Laboratory, CBI, New Delhi

Dr. SANJEEV
Central Forensic Science
Laboratory, Chandigarh

Dr. RAKESH Kr. GOREA
Gian Sagar Medical College
Patiala

Dr. VARUN KAPOOR (IPS)
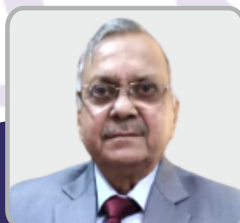ADGP, Rustamji Armed Police
Training College, Indore

D. C. SAGAR (IPS)
ADGP Police Training & Research,
Bhopal, M.P.

K. V. RAVIKUMAR
Rashtriya Raksha University
Gujarat

Dr. G. K. GOSWAMY (IPS)
Inspector General of Police,
ATS Chief, Uttar Pradesh

MOHINDER SINGH
Former GEQD,
Shimla & Hyderabad
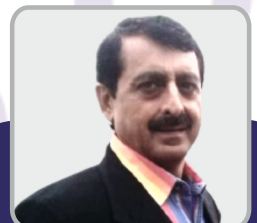
DEEPAK HANDA
(Former) Central Forensic Science
Laboratory, CBI, New Delhi

DEEPA VERMA
Forensic Science Laboratory
NCT of Delhi

Dr. RAJESH VERMA
Forensic Science Laboratory
Mandi

JOHN PATRICK MOLONEY
Forensic Comparison Software,
Gr. Melbourne

IASR Advisory Board

Dr. G. S. SODHI
Forensic Science Unit, S.G.T.B. Khalsa College, DU, New Delhi

Dr. RUKMANI KRISHNAMURTHY
Helik Advisory Ltd., Academic Council Member, NFSU, Gujarat

Dr. SELINA LEOW
NSW Forensic Odontology Unit, Australia

Dr. JOSEPH De LADURANTEY
The Vollmer Institute California

Dr. MADHULIKA SHARMA
(Former) Forensic Science Laboratory, NCT of Delhi

Dr. S. L. VAYA
Pioneer of Forensic Psychology In India

Dr. MUKESH YADAV
Government Allopathic Medical College, Banda

Prof. JASON PAYNE JAMES
William Harvey Research Institute, London

STEVEN DAVID LAMPLEY
The Oliphant Institute of Forensics, USA

RAKSHIT TANDON
Hackdev Technology Pvt. Ltd. Noida

Dr. V. V. PILLAY
Amrita Institute of Medical Sciences & Research Center, Kerela

Prof. TEJ BAHADUR SINGH
Centre for Psychological Sciences, Central University of South Bihar, Gaya

Dr. DANILO L. MAGTANONG
College of Dentistry, University of the Philippines, Manila

Sh. NILENDU BIKASH BARDHAN
(Former Director) CFSL, CBI, New Delhi

DINESH O BAREJA
Open Security Alliance India Watch, Mumbai

Dr. GHYASUDDIN KHAN
U.P. State Medico Legal Cell Lucknow

Dr. SAMEERA AL HAMMADI
Dept. Forensic Medicine & Pathology Justice Dept., Emirate, Abu Dhabi

Dr. ASHA SRIVASTAVA
Forensic Psychology, CFSL, CBI, New Delhi

SANTOSH KHADSARE
DFIR & Expert Witness, Govt. of India, Delhi

NA VIJAYASHANKAR
Foundation of Data Protection Professionals in India, Karnataka

IASR Advisory Board

Dr. WILLIAM R. BELCHER
University of Nebraska-Lincoln, Nebraska

OMVEER SINGH
Ministry of Electronics & Information Technology, New Delhi

Dr. EVI UNTORO
Faculty of Medicine, University of Trisakti, Indonesia

CLOYD STEIGER
Author & The American Investigative Society of Cold Cases, Washington

AI-SHARIF HASHEM MOGAHED
Forensic Medicine Administration, Ministry of Justice, Egypt

Dr. KAVITA SHARMA
Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

Prof. TRIVENI SINGH (IPS)
S. P., (Cyber Crime), U. P. Police Lucknow

Dr. AJAY SHARMA
State Forensic Science Laboratory, Jaipur

BARRY A. J. FISHER (Retd.)
Los Angeles County Sheriff's Crime Laboratory Director, USA

Dr. GAGANDEEP SINGH
CRC Press, Taylor & Francis Group Patiala

Dr. MOHAMMED NASIMUL ISLAM
Faculty of Medicine, Universiti Teknologi MARA (UiTM), Malaysia

KEVIN M. SULLIVAN
Author, USA

RAJ SHRIVASTAVA
Forensic Science Laboratory Sagar

Dr. SHUBHRA SANYAL
Counsellor (OHBII) Sewa Kuthir, New Delhi, Former Senior Reader (NICFS)

SHANE TURNIDGE
SST Forensics, Canada

ARUN SHARMA
State Forensic Science Laboratory Lucknow

Dr. GAURAV GUPTA
Ministry of Electronics & Information Technology, New Delhi

Prof. (Dr.) RAAKESH KRIPLANI
RK Psychotherapy, CIIPS Nagpur

Dr. CHANDNI SRINIVASAN
Psychotherapist & Counsellor Chennai

Dr. SONI KEWALRAMANI
Amity University, Uttar Pradesh Lucknow Campus

IASR Advisory Board

SAMIR DATT
Fellow - Indian Police Foundation

PRINCE BOONLIA
Digital 4n6 Journal
Udaipur

Dr. SANJAY GUPTA
Dept. Forensic Medicine & Toxicology,
Pramukhswami Medical College,
Karamsad

Dr. BHARATI MEHTA
Psychology Gym & CosmeClinic
Pune

AASHISH SUTAR
Ministry of Defence, Govt. of India
New Delhi

HEMANTA KUMAR PANDA
Retd. Fingerprint Expert
Bhubaneswar

Dr. AMAR JYOTI PATOWARY
Dept. Forensic Medicine &
Toxicology, NEIGRIHMS, Shillong

Dr. A. NAGARATHNA
National Law School of India
University, Bengaluru

Dr. SHALINI GUPTA
King George's Medical University
Lucknow

MOHAMMED ABO ELAZM
Alexandria Head of Forensic
Evidence, Egypt

IASR

International Association of
Scientists & Researchers

IASR Organising Committee

Convenor in Chief

Convenor in Chief

Dr. RANJEET Kr. SINGH
President
International Association of
Scientists & Researchers

PHANEENDAR B. N.
Chairman
Clue4 Evidence Foundation

Convenor
Mahesh Sharma
SIFS India

Convenor
Afreen Tarannum
SIFS India

Convenor
Kratika Mishra
SIFS India

Convenor
Arti Varshney
SIFS India

Convenor
Saumya Solanki
SIFS India

Convenor
Preeti Kiran
SIFS India

Treasurer
Thomas T.O.
SIFS India

Organising Secretory
Madhuri Vagal

Organising Secretory
Dr. Pooja Chakraborty

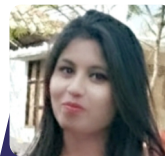Organising Secretory
Prerna Patel

Organising Secretory
Ruchika Dwivedi

Organising Secretory
Sudhakar Yadav

Organising Secretory
Falak Khan

Organising Secretory
Taniya Jaiswal

Organising Secretory
Priya Singh

Supported by

SIFS INDIA
Sherlock Institute of Forensic Science India

IASR

International Association of Scientists & Researchers

IASR Core Committee

Dr. ANKIT SRIVASTAVA
Dr. A.P.J. Abdul Kalam Institute of Forensic Science & Criminology, Bundelkhand University, Jhansi

Dr. RITESH SHUKLA
Ahmedabad University, Gujarat

Dr. SUMIT CHOUDHARY
Rashtriya Raksha University, Gujarat

Dr. HEMLATA PANDEY
Seth GS Medical College and KEM Hospital, Mumbai, India

Dr. ASHISH BADIYE
Government Institute of Forensic Science, Nagpur

Dr. RICHA ROHATGI
Amity University Gurugram

NITIN PANDEY
Consultant Cyber, Police Headquarters, Lucknow

Dr. KANCHANA KOHOMBANGE
International Hand Analyzing Consultancy, Sri Lanka

Dr. NEETI KAPOOR
Government Institute of Forensic Science, Nagpur

RAMANDEEP SINGH
Evolve Security, USA

MA TERESA G. de GUZMAN
University of the Philippines, Manila

HANSI BANSAL
Government Institute of Forensic Science, Nagpur

Supported by

SIFS INDIA
Sherlock Institute of Forensic Science India

IASR Scientific Committee

Prof. MUKESH Kr. THAKAR
Dept. of Forensic Science, Punjabi University Patiala

ARVIND SUD
Senior Forensic Expert Hoshiarpur

Dr. RAJINDER SINGH CHANDEL
Dept. of Forensic Science, Punjabi University Patiala

Dr. RACHEL BOLTON-KING
School of Law, Policing & Forensics, Staffordshire University, UK

Prof. GYANESHWER CHAUBEY
Dept. of Zoology, Banaras Hindu University, Varanasi

TIFFANY ANN ROY
ForensicAid Llc., United States

Prof. (Dr.) GURMANJIT RAI MAAN
Forensic Medicine & Toxicology, MMIMSR Mullana, Ambala

Prof. (Dr.) BHARATH Kr. GUNTHETI
Dept. of Forensic Medicine & Toxicology, Mamata Medical College, Telangana

BULENT AYDOGMUS
Sahtecilikgrafoloji Uzmani, Turkey

Dr. S. K. PAL
State Forensic Science Lab., DFS, Junga

Dr. DENISE GEMMELLARO
Dept. of Biology, Kean University, US

Dr. AKHILESH PATHAK
Dept. of Forensic Medicine & Toxicology, AIIMS, Bathinda

Dr. KHALID KHALID
Dept. of Dentistry, Nile University, Sudan

Prof. KOMAL SAINI
Dept. of Forensic Science, Punjabi University Patiala

Prof. PIYUSH KAPILA
Dept. of Forensic Medicine, IGM College & Hospital, Shimla

Prof. T. NATARAJA MOORTHY
Faculty of Health & Life Sciences, Management & Science University, Malaysia

Dr. INDERJIT SINGH
Senior Forensic Expert, Patiala

VIJAY RUSTAGI
Senior Forensic Expert, Gurugram

Dr. ADITYA SHARMA
Dept. of Forensic Medicine, IGM College Shimla

E. SAI PRASAD CHUNDURU
CFSL Hyderabad, DFSS, MHA, Govt. of India

Dr. JAYASANKAR P. PILLAI
Dept. of Oral Pathology Govt. Dental College & Hospital, Ahmedabad

Dr. VIJAY ARORA
Dept. of Forensic Medicne, Dr. R. P. Govt. Medical College, Kangra

Dr. NARESH KUMAR
Forensic Science Laboratory, Delhi

Dr. ANU SINGLA
Dr. A.P.J. Abdul Kalam Institute of Forensic Science & Criminology, Bundelkhand University, Jhansi

Dr. NEETA SHARMA
Dept. of Oral Medicine & Radiology, H.P. Govt. Dental.College & Hospital, Shimla

Dr. SHALOO MALIK
Regional Forensic Science Lab., Jodhpur

Dr. ARUNA MISHRA
Forensic Science Laboratory, New Delhi

Dr. RAKHI KHANNA
State Forensic Science Laboratory, Jaipur

Supported by
SIFS INDIA
Sherlock Institute of Forensic Science India

IASR Scientific Committee

Dr. M. K. SUNIL
Dept. of Oral Medicine
& Radiology,TMU,
Moradabad

Dr. PRATEEK RASTOGI
Dept. Forensic Medicine
& Toxicology, Kasturba
Medical College, Mangalore

Dr. VINDRESH MISHRA
CFSL, Kolkata
DFSS, MHA
Govt. of India

SANJEEV Kr. GUPTA
Forensic Science
Laboratory, New Delhi

Dr. CARLOS A. GUTIERREZ
True Forensic Science
United States

Dr. AMIT PATIL
Dept. of Forensic Medicine
& Toxicology, AIIMS,
Patna

ANDREW REITNAUER
Delta Forensics, LLC,
United States

Dr. KRITHIKA RAJESH
Forensic Science
Laboratory, Ahmedabad

Dr. VIJAY R. CHOUREY
Dept. of Forensic Science,
Govt. Holkar (Model Autonomous)
Science College, Indore

Dr. RAJIV PANDEY
AIIT, Amity University,
Lucknow

Dr. POOJA RASTOGI
SMS&R,
Sharda University,
Greater Noida

Dr. RAJNISH KUMAR SINGH
Forensic Science
Laboratory, New Delhi

NARENDRA KUMAR
Forensic Science
Laboratory,U.P.

Dr. PREETI SINGH
National Post Graduate
Autonomous College
Lucknow

AMIR LIBERMAN
Nemesysco Limited,
Israel

VIJAY VERMA
Central Forensic Science
Laboratory,CBI,
New Delhi

Dr. SWATI SHRIVASTAVA
State Forensic Science
Laboratory, MP

Dr. PARDEEP SINGH
Pt. Jawahar Lal Nehru
Govt. Medical College
and Hospital, Chamba

Dr. RANJEETA KUMARI
Central Forensic Science
Laboratory, CBI, New Delhi

ABY JOSEPH
Amity University,
Dubai

Dr. PRIYANKA KAPOOR
Faculty of Dentistry,
Jamia Millia Islamia,
New Delhi

Dr. JONATHAN ANDREW BROOKS
King's College,
London, UK

REENA SHARMA
The Mind Practice,
Ahmedabad

Dr. GUNVANTI B. RATHOD
Pathology & Lab
Medicine Department,
AIIMS, Bibinagar

Dr. CRISTIANA PALMELA PEREIRA
University of Lisbon,
Portugal

Dr. UTSAV PAREKH
Dept. of Forensic Medicine
& Toxicology, PS Medical
College, Karamsad

Dr. KRISHNADUTT H. CHAVALI
Dept. of Forensic Medicine
& Toxicology, AIIMS,
Raipur

Dr. POOJA PURI
Amity Institute of Forensic
Sciences, Amity University
Noida

IASR Scientific Committee

Dr. VIVEK SAHAJPAL
State Forensic Science Laboratory, Shimla

Dr. PRIYANKA KACKER
School of Behavioral Science of NFSU, Gandhinagar

Dr. AMAR PAL SINGH SHOKEEN
Forensic Science Laboratory, Delhi

Dr. SUDHEER B. BALLA
Panineeya Institute of Dental Science & Hospital, Telangana

Dr. MUKESH SHARMA
Physics Division, State Forensic Science Laboratory, Jaipur

Dr. SWATI DUBEY MISHRA
SVIFS, Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore

NEERAJ KUMAR VARSHNEY
Forensic Science Laboratory, Patna

NILESH B. WAGH
Central Forensic Science Laboratory, CBI, Navi Mumbai

Dr. SWIKAR LAMA
Sardar Patel University of Police, Security & Criminal Justice, Jodhpur

Dr. PRAVEEN JHA
State Forensic Science Laboratory, Sagar

Dr. ADEMIR FRANCO
School of Dentistry, University of Dundee, UK

Dr. YADUKUL S.
Dept. of Forensic Medicine & Toxicology, AIIMS, Hyderabad

Dr. ALOK PANDYA
Institute of Advanced Research, Gandhinagar

Dr. JIJU PV
CFSL Pune, DFSS, MHA, Govt. of India

Dr. NEERAJ TANEJA
Mobico Comodo Pvt Ltd. Gurugram

Dr. PRATEEK PANDYA
Amity Institute of Forensic Sciences, Amity University Noida

Dr. RAJESH SINGH YADAV
Dept. of Criminology & Forensic Science, Dr. Harisingh Gour Vishwavidyalaya, Sagar

Dr. PUNEET SETIA
Dept. of Forensic Medicine & Toxicology, AIIMS, Jodhpur

RAJVEER
State Forensic Science Laboratory, Jaipur

MOHAMMED AL SUWAIDI
Fingerprint Expert Dubai Police, UAE

Dr. BINAYA KUMAR BASTIA
Dept. of Forensic Medicine & Toxicology, AIIMS, Rishikesh

Dr. NIRAJ RAI
Ancient DNA Lab Birbal Sahni Institute of Palaeosciences, Lucknow

DURGA PRASAD GANGWAR
CFSL Chandigarh, DFSS, MHA, Govt. of India

Dr. AMAN CHOWDHRY
Faculty of Dentistry, Jamia Millia Islamia, New Delhi

Dr. LALIT PRATAP CHANDRAVANSHI
CTM, IRTE, Faridabad

Dr. PRADEEP JAIN
State Forensic Science Laboratory, Jaipur

Dr. PRASHANT AGRAWAL
School of Allied Health Sciences, Sharda University, Greater Noida

R. SURESH
CFSL Assam, DFSS, MHA, Govt. of India

IASR

International Association of
Scientists & Researchers

IASR Scientific Committee

Dr. VIKAS MESHRAM
Dept. of Forensic Medicine & Toxicology, AIIMS, Jodhpur

HANAN AHMAD ALMULLA
Forensic DNA Expert, Police HQ, Dubai

V.B. KASHYAP
Fingerprint Expert, Haryana

Dr. ILA GAUTAM
Forensic Science Laboratory, Sagar

Dr. MANOJ PARCHAKE
Dept of Forensic Medicine, Seth GS Medical College, KEM Hospital, Mumbai

Dr. INDRAJIT KHANDEKAR
Dept. Forensic Medicine & Toxicology, MGIMS, Sewagram

Dr. MANOJ KUMAR MOHANTY
Dept. of Forensic Medicine & Toxicology, AIIMS, Bhubaneswar

Dr. HIRAK RANJAN DASH
Forensic Science Laboratory, Bhopal

Dr. VISHAL SHARMA
Inst. of Forensic Science & Criminology, Panjab University, Chandigarh

Dr. NADEEM MUBARIK
DNA Fingerprinting Unit, State Forensic Science Lab., Srinagar

Dr. PRAGNESH PARMAR
Dept. of Forensic Medicine & Toxicology, AIIMS, Bibinagar

Dr. TREVILLE PERIERA
DY Patil University School of Dentistry, Navi Mumbai

Dr. KARPAGAVALLI SHANMUGASUNDARAM
Dept. Oral Medicine & Radiology, Seema Dental College & Hospital, Rishikesh

Dr. NEELAM ARYA
Forensic Science Laboratory, Haryana

ELENA FELDMAN
F_Lab, Chelyabinsk State University, Russia

Dr. ANUREKHA YADAV
Forensic Science Laboratory, MP

Dr. NRASHANT SINGH
Amity University Dubai

Dr. JEYASEELAN AUGUSTINE
Dept. of Oral Pathology, Maulana Azad Institute of Dental Sciences, New Delhi

PRASHANT SHARMA
Central Forensic Science Laboratory, CBI, New Delhi

Dr. SUDHIR YADAV
Dept. of Forensic Science, Guru Ghasidas University, Bilaspur

Dr. DOMINGO MAGLIOCCA
Judicial Police Section Italy

Dr. DEEPIKA BABLANI POPLI
Faculty of Dentistry, Jamia Millia Islamia, New Delhi

PAWAN DESAI
MitKat Advisory Services Pvt. Ltd, Gurugram

Dr. WASSIM MOHAMED RIHAWI
Syrian Forensic Odontology Association, Syria

Dr. MONICA MEHENDIRATTA
ITS Dental College, Hospital & Research Centre, Greater Noida

Dr. GAURAV MAHESHWARI
Quality Research & Analytical Labs Pvt. Ltd, New Delhi

VIJAY KUMAR YADAV
Dr. A.P.J. Abdul Kalam Institute of Forensic Science & Criminology, B.U., Jhansi

Dr. ROHIT SRIVASTAVA
College of Life Science, CHRI Campus, Gwalior

Supported by

SIFS INDIA
Sherlock Institute of Forensic Science India

IASR Scientific Committee

Dr. GULSHAN SHRIVASTAVA
Dept. of Computer Science & Eng., Sharda University, Greater Noida

Dr. RAJEEV JAIN
CFSL Chandigarh, DFSS, MHA, Govt. of India

Dr. HIMANSHU KHAJURIA
Amity Institute of Forensic Sciences, Amity University Noida

ABHISHEK VASHISTH
Forensic & Handwriting Expert, Dehradun

MEBIN WILSON THOMAS
Jain (Deemed-to-be) University, Bengaluru

Dr. RAJESH KUMAR
Dept. of Forensic Science, Govt. Institute of Forensic Science, Aurangabad

Dr. MANAVPREET KAUR
Wikimedia Foundation, USA

KALPESH SOLANKI
SFSRM, Rashtriya Raksha University, Gujarat

RAKHI R. WADHWANI
Senior Assessor Mumbai

Dr. ASHUTOSH TRIPATHI
Institute of Sciences, Sage University, Indore

Dr. MADHUSUDAN ASTEKAR
Institute of Dental Sciences, Bareilly International University Bareilly

Dr. MALVIKA MEHTA
National Centre for Handwriting Studies Pune

SAILAJA VADLAMUDI
SAP Labs India Bengaluru

Dr. KAMLESH KAITHOLIA
Forensic Science Laboratory, MP

Dr. JAGADISH P. RAJGURU
Hi-Tech Dental College & Hospital,Utkal University, Bhubaneswar

Dr. KAPIL KUMAR
Dept. of Biochemistry & Forensic Science Gujarat University, Ahmedabad

RITESH BHATIA
Founder, V4WEB Cybersecurity, Mumbai

Dr. HARSH JOSHI
Information Security Group, HDFC Bank, Mumbai

MAHESH TRIPATHI
SFSRM, Rashtriya Raksha University, Gujarat

Dr. ASHA PAHWA
Forensic Science Laboratory, New Delhi

Dr. ASTITVA ANAND
Forensic Science Laboratory, Gujarat

Dr. PANKAJ KUMAR PANDEY
State Forensic Science Laboratory, Sagar

Dr. NEEHARIKA SRIVASTAVA
G.D. Goenka University, Gurgaon

ANNA BARBARO PhD
Worldwide Association of Women Forensic Experts, Italy

Dr. YMELDA WENDY VELEZMORA MONTES
Instit. Legal Medicine & Forensic Sciences, SPOLFOC, Peru

Dr. POONAM SINGH
Regional Forensic Science Laboratory, Bhopal

Dr. FRENY KARJODKAR
Dept. of Oral Medicine & Radiology, Nair Hospital Dental College, Maharashtra

Dr. MOHINEESH CHANDRA
Forensic Science Laboratory, New Delhi

IASR Scientific Committee

Dr. PARUL KHARE SINHA
Alpha Dental Clinic, Shanghai

Dr. HIMAKSHI BHARDWAJ
Forensic Science Laboratory, New Delhi

AMRIT CHHETRI
Digital Forensics Analyst, Cyber Security Evangelist, DFIR Researcher (Edge AI & QML), Siliguri, (West Bengal)

R. APARNA
Jain (Deemed-to-be University), Bangalore

Dr. JYOTI SINGH
Amity Institute of Forensic Sciences, Amity University, Noida

Dr. ALI RAZA
Arba Minch University, Ethiopia

ZADIA-KAY SMITH
Jamaica Constabulary Force, Jamaica

HEENA GOSWAMI
Gujarat National Law University, Gandhinagar

Dr. ABIRAMI ARTHANARI
Dept. of Oral Pathology, Saveetha Dental College & Hospital, Tamil Nadu

Dr. UTTARA DESHPANDE
DentoUpanishad Dental Clinic & Implant Center, Pune

Dr. KUSUM SINGAL
PGIMER, Chandigarh

Dr. ARUSHI CHAWLA
Dept. of Applied Sciences, Parul University, Gujarat

Dr. RISHA JASMINE NATHAN
Dept. Forensic Science, Galgotias University, Greater Noida

KAPIL DEV
Forensic Science Laboratory, Moradabad

MAJID KHAN
Forensic Science Laboratory, Muzzafarpur

Dr. RAJEEV KUMAR
Dept. of Forensic Science, Galgotias University, Greater Noida.

MAYANK KR. DUBEY
Mody University, Rajasthan

Dr. SUDEENDRA PRABHU
Centre for Foresnic Odontology, Yenepoya Dental College, Mangalore

Dr. SOWJANYA VASISTA
Abyaas Educare Pvt. Ltd., Bengaluru

DR. KRITI NIGAM
Dr. A.P.J. Abdul Kalam Institute of Forensic Science & Criminology, Bundelkhand University, Jhansi

MANISH Kr. SAINI
Physics Division, State Forensic Science Lab., MP

Dr. KAVERI CHAUHAN
MindSpark PsycCare, Training and Development Karnal

Dr. SHIVANI BANSAL
Nair Hospital Dental College, Maharashtra

SHYAM CHANDEL
Cyber Fraud Helpline, Udaipur

VICHAR MISHRA
Jain (Deemed-to-be) University, Bangalore

Dr. JASKARAN SINGH
Dept. of Forensic Science, Sharda University, Greater Noida

Dr. PRIYANKA SINGH
Amity Institute of Forensic Sciences, Amity University, Noida

Dr. MANOJ KUMAR VERMA
Chemistry Division, Forensic Science Lab., Lucknow

IASR Scientific Committee

PALLAVI MALIK CHOPRA
Forensic Science Laboratory, Mohali

VINNY SHARMA
Div. of Forensic Science, Galgotias University, Greater Noida.

ABHIJEET SARKAR
Dept. of Forensic Science, Govt. Institute of Forensic Science, Aurangabad

Dr. AMBREEN KAUR
Luxmi Bai Institute of Dental Sciences & Hospital, Patiala

VEDIKA AGARWAL
Mental Health Foundation, India

DIVYA DUBEY
Spire Solutions, Dubai

PRACHI KATHANE
SFSRM, Rashtriya Raksha University, Gujarat

MELBA KURIAKOSE
Impress.ai, Kochi

Dr. DEEPIKA BHANDARI
State Forensic Science Laboratory, DFS, Junga

KRUPA NISHAR
School of Forensic Psychology, National Forensic Sciences University, Gujarat

SUBHASISH SAHOO
Forensic Science Laboratory, Odisha

Dr. HUNNY MATIYANI
LNJN National Institute of Criminology & Forensic Science, New Delhi

SUCHISMEETA BEHERA
Forensic Science Laboratory, Odisha

Dr. RUCHI SHARMA
Forensic Science Laboratory, Delhi

ANU SEBASTIAN
Div. Forensic Science Laboratory, Bengaluru

DEEPAK KUMAR
Digital Forensics & Cyber Intelligence, India

NOUZIA NOORDEEN
SAFI Institute of Advanced Study, SAFI College, Kerela

Dr. DAS AMBIKA BHARTI
Dept. of Psychological Sciences, Central University of South Bihar, Gaya

NIDHI PANDYA
Dept. of Forensic Science Gujarat University Ahmedabad

GEORGE DIXON
Jamaica Constabulary Force, Jamaica

MOHIT YADAV
Craw Cyber Security Pvt. Ltd., New Delhi

SHIFA CYCLEWALA
Hacktify Cyber Security, Mumbai

ROHIT GAUTAM
Hacktify Cyber Security, Mumbai

SHUBHAM GAUTAM
Psyberbull Pvt. Ltd. Delhi

SUDHANSHU SHEKHER TIWARI
SFSRM, Rashtriya Raksha University, Gujarat

RITU BHARTI
Govt. Holkar (Model Autonomous) Science College, Indore

MANASHREE MANE
Jain (Deemed-to-be-University) Bangalore

SRI RAM
PrimeFort Pvt. Ltd., India

IASR

International Association of Scientists & Researchers

IASR Scientific Committee

NAVEEN PAL
Capgemini
India

NIRALI BHATIA
V4WEB Cyber Security & Cyber B.A.A.P, Mumbai

GOPIKA BAGHEL
Forensic Science Education Society, Raipur

DEEP SHANKAR YADAV
eSec Forte Technologies, Gurugram

SANTOSH CHALUVADI
Supraja Technologies, Andhra Pradesh

RASHMI DILIP KADU
Jain (Deemed-to-be) University, Bengaluru

DAVINDER SINGH
Cylos Consulting Private Limited, New Delhi

GAURAV SHARMA
Cyber Security Professional, Gurugram

Dr. SHWETA SHARMA
SFSRM, Rashtriya Raksha University, Gujarat

VINAY SINGH
Forensic Science Laboratory, New Delhi

Dr. MAMTA PAL
Jain (Deemed-to-be) University, Bengaluru (Former)

SAURABH ATHAWALE
Kcyber Experts Pvt. Ltd., Nagpur

Dr. SWATHI KUMARESWAR
Dept. of Forensic Odontology, JSS Dental College & Hospital, Mysuru

JIN LEE
Independent Lawyer, Delhi

ROHIT JAIN
Advocate High Court, Indore

Call for Paper

GUIDELINES FOR STUDENT & PROFESSIONAL CATEGORY

Submission of Paper

◆ The paper should be **ORIGINAL** and **UNPUBLISHED** offering new insights, a new approach, or new knowledge to the body of literature.

◆ The abstract should be of a **maximum of 350 words** followed by a **minimum of 5 keywords** in the format given.

◆ All participants should email their respective abstracts before the mentioned deadline, **15th April 2021** at **iasrforensicconference@gmail.com.**

Criteria for Evaluation

◆ The evaluation depends upon the presentation skills, content, topic relevancy, and answers given to the jury.

◆ All abstracts submitted would be published in the **SOUVENIR of IASR.**

◆ The outstanding papers would be published in the **Academic Journal of Forensic Science, IASR** providing FREE SCHOLARSHIP.

Presentation of Paper

◆ The paper has to be presented in PowerPoint 2013/2010 or earlier in 16:9 ratio slides.

◆ A maximum of **10 slides** is allowed to present. The time limit for the presentation will be **8 minutes** followed by a **2-minutes** discussion with video **'ON'**.

◆ The presentation should include an introduction, material, and methodology, information regarding collected data, major findings, conclusion, etc.

◆ In the case of multiple authors, only one author out of the two would be allowed to present the ePoster. All Co-authors would receive the participation eCertificate as co-authors.

Format of Paper: The manuscript should follow the format:

◆ Title of the paper, Name, Position with Institute name, Contact no. and Email Address.

◆ Approximately **300 words of abstract** followed by a **minimum of 5 keywords** along with the final paper.

◆ The paper should follow the font Times New Roman size 12 (Justify alignment) and heading size 14 (aligned centrally) in MS-Word Format.

◆ All references should follow the MLA (8th edition) style. All tables and figures should be appropriately numbered.

Awards for Best Scientific Paper

The winners in both **STUDENT** and **PROFESSIONAL** category will receive:

Three outstanding Paper would receive an **eCertificate of Excellence** in each Category

STUDENT   **PROFESSIONAL**

Fingerprint Analysis

Supported by
SIFS INDIA
Sherlock Institute of Forensic Science India

Call for ePoster

GUIDELINES FOR STUDENT & PROFESSIONAL CATEGORY

Submission of ePoster

◆ The ePoster should include completed or ongoing scientific research, proposing innovative ideas, interesting case study, etc.

◆ The abstract should be a **maximum of 350 words** followed by a **minimum of 5 keywords** in the format given.

◆ All participants should email their respective abstracts (approximate 350 words) and ePoster at **iasrforensicconference@gmail.com** before the mentioned deadline, **15th April 2021.**

Criteria for Evaluation

◆ The evaluation depends upon the presentation skills, content, topic relevancy, and answers given to the jury.

◆ All abstracts submitted would be published in the **SOUVENIR of IASR.**

Presentation of ePoster

◆ The ePoster has to be presented in the PowerPoint 2013/2010 or earlier in 16:9 ratio slides.

◆ The ePoster has to be made on a single (**ONE**) slide having information such as introduction, method and methodology, results, and conclusion.

◆ The time limit allotted for the presentation will be **5 minutes** followed by a **2-minutes discussion** with video **'ON'**.

◆ In the case of multiple authors, only one author out of the two would be allowed to present the ePoster. All Co-authors would receive the participation eCertificate as co-authors.

◆ Only the main Presenter would receive the Winning eCertificate of Achievement.

◆ The best ePoster in the two different categories (Student and Professional) will be duly acknowledged.

Awards for Best Scientific ePoster

The winners in both **STUDENT** and **PROFESSIONAL**

category will receive:
Three outstanding ePosters would receive an
eCertificate of Excellence in each Category

STUDENT   **PROFESSIONAL**

Fingerprint Analysis

Supported by
SIFS INDIA
Sherlock Institute of Forensic Science India

Awards

Awards for Best Scientific Paper & ePoster

The winners in both **STUDENT** and **PROFESSIONAL** category will receive:

Three outstanding Paper & ePoster would receive an **eCertificate of Excellence** with **Cash Prize** in each Category

STUDENT

PROFESSIONAL

CASH PRIZE OF Rs.2000/-

CASH PRIZE OF Rs.1500/-

CASH PRIZE OF Rs.1000/-

The Best Paper will be published in Journal of IASR

Fingerprint Analysis

Supported by

Sherlock Institute of Forensic Science India

4th INTERNATIONAL eCONFERENCE-2021

NATIONAL & INTERNATIONAL PARTICIPANTS
FOR STUDENT AND PROFESSIONAL

Student
(Streamed on Zoom & YouTube with Participation eCertificate)
₹100

Professional
(Streamed on Zoom & YouTube with Participation eCertificate)
₹250

ePoster/Paper Presentation
(Streamed on Zoom & YouTube)
₹ 300

LAST DATE OF SUBMITTING ePOSTER/PAPER ABSTRACT
15th APRIL 2021

Register On: www.forensicevents.com

*ePoster and Paper Participants will receive **Conference Participation** and **Competition Participation eCertificate** and Winners would receive **Certificate of Excellence**.*

Guidelines for Paper and ePoster Submission
https://youtu.be/mEqdhPXAmB8

Social media handle:

www.youtube.com/Forensic365

www.facebook.com/iasrorg

www.linkedin.com/in/iasrorg/

www.instagram.com/Forensicscienceinstitute

Email   : iasrforensicconference@gmail.com

Contact : +91-98188-77002

Website : www.forensicevents.com

linktr.ee/forensicscienceinstitute

Fingerprint Analysis

linktr.ee/forensicscienceinstitute, Contact us: +91 98188 77002

Supported by
SIFS INDIA
Sherlock Institute of Forensic Science India

4th INTERNATIONAL eCONFERENCE-2021

TABLE OF CONTENT

Paper Category

Fingerprint Analysis

ePoster Category

ePOSTER Code	Author and Co-authors	Title
EP 01	Dr. Revathi Rajan Sofia Haniza Md Zabit Vanitha Devaraja	Organic Food Waste To Fingerprint Powder: Forensic Goes Green
EP 02	Dr.Yadukul.S Dr.Pragnesh Parmar Dr.Prashanth Mada Dr.Divya Reddy P	Use Of Fingerprint Biometric In Workplace During COVID Times: A Critical Viewpoint
EP 03	Arti Varshney Garima Sagar Sakshi Bisht	Finger Knuckle Characteristics: A Promising Biomterics
EP 04	Surajnarayansingh D. Kushwaha Dr. Ashish Badiye Dr. Neeti Kapoor	Laser Technique For Latent Fingermark Development
EP 05	Anirudhvaibhav Gupta	Cloning Of A Fingerprint
EP 06	Meenal Goswami	IR- LASER Ablation Technique: A Method Of Analysing Fingerprints
EP 07	Neelkamal Ganesh Battu	Contactless Fingerprint System
EP 08	Heenaba Jadeja Dr. Rajesh Babu	Comprehensive Dermatoglyphics Study On Ridge Dimensions, Pore Size And Assessment Of The Sweat Composition Among The Industrial Workers
EP 09	Anjali Tamgadge	Fingerprints From Deceased
EP 10	Sukriti Ghanash Pushkar Yadav	Reliability Of Unconventional Methods Of Developing Fingerprint

Fingerprint Analysis

Paper Category

MOTHER HAS AFFECTION TOWARDS HER CHILDREN. BUT MORE AFFECTION TOWARDS….. SON OR DAUGHTER? – A PILOT STUDY ON "INHERITANCE OF FINGERPRINT PATTERN" AMONG MALAYSIAN INDIAN FAMILIES

Prof. T. Nataraja Moorthy[1]

[1]Professor of Forensic Sciences, Faculty of Health and Life Sciences, Management and Science University, Shah Alam, Selangor, Malaysia,

Abstract

Fingerprint identification is one of the most well-known and publicized biometrics. It is globally used to identify both live and dead. Because of their uniqueness and consistency over time, fingerprints have been used for identification for over a century, more recently becoming automated (i.e. a biometric) due to advancements in computing capabilities. A fingerprint usually appears as a series of dark lines that represent the high, peaking portion of the friction ridge skin, while the valley between these ridges appears as white space and are the low, shallow portion of the friction ridge skin. The most widely used recognition technique, minutiae-based matching, relies on the minutiae points, specifically the location and direction of each point. 53 Malaysian Indian families who accepted for sample donation. A family consists of a father, a mother, and two children. Following the standard procedure, fingerprints were collected and statistically analyzed the inheritance of fingerprint patterns. The result showed that the inheritance of fingerprint pattern frequency from mother to son is the highest (82.7%), followed by father to daughter (79.6%), father to son (71.2%), and the least mother to daughter (70.4%), and considered "affection". Thus, this pilot investigation concluded with a finding that inheritance of fingerprint pattern and affection shows a statistical relationship among Malaysian Indian family members. The mother has comparatively more affection towards her son, while the father has more affection towards his daughter. My observation confirms this fact since I have been in close and friendly relationship with many Indian families in Malaysia, for about two decades.

Keywords: fingerprints, frequency, friction ridge analysis, sample donation, inheritance.

PRACTICAL APPROACH FOR FINGERPRINT RECOGNITION BY COMBINING LOCAL BINARY PATTERN AND PRINCIPAL COMPONENT ANALYSIS

Dr. Kamini H. Solanki[1], Prof. Abhishek Mehta[2]

[1]Associate Professor, Parul Institute of Computer Application, Parul University

[2]Assistant Professor, Parul Institute of Computer Application, Parul University

Abstract

Fingerprint is used for real time application nowdays. So reliability is the more important thing for security. Fingerprint is rapidly becoming area of interest in computer science field. In this paper, fingerprint recognition is done using combination of local binary pattern and principal component analysis for better recognition result. The feature extraction is an essential step for image analysis, object representation, visualization, and many other image-processing tasks. PCA is used for dimension reduction. LBP is used to measure the expression of Fingerprint. Hybrid approach will increase the recognition rate (RR) of Fingerprint and decreased verification time and false match rate. So it is most suitable for real time application. We compared proposed method with both PCA and LBP to compute these changes that increased Fingerprint recognition rate and decreased recognition time and false match rate.

Keywords: Fingerprint image representation, LBP, PCA, Recognition rate, false match rate.

Fingerprint Analysis

DIFFICULTIES FACED DURING RECORDING FINGERPRINT FOR IMMIGRATION

Vikas Kumar[1]

[1]Sherlock Institute of Forensic Science, New Delhi

Abstract

Fingerprints are inborn and difficult to alter in any way. In the modern era, where the fingerprint is commonly used by people for individuality. Fingerprinting for the immigration process is a complex activity that requires highly qualified fingerprint experts. Fingerprint has been commonly used as a reliable source of individual identification in criminal investigations for many years, and as a result, they have a special place in the world of forensic science. It has been referred to as the most important proof since a long time ago. This paper deals with the various challenges and difficulties that an examiner faces taking fingerprints. There are lots of difficulties like incorrect finger placement, dry finger, light prints, dark images from wet or perspiring fingers, degraded or worn ridges structure, etc. This review paper deals with the difficulties faced during fingerprinting in the immigration process.

Keywords: Immigration, PCC, fingerprint, forensic science, identification, clearance.

Fingerprint Analysis

USE OF NANOPARTICLES FOR THE DEVELOPMENT OF LATENT FINGERPRINTS

Poonam Moon[1], Ashish Badiye[2], Neeti Kapoor[2]

[1]Dept. of Forensic Science, G. H. Raisoni University Amravati, Maharashtra

[2]Dept. of Forensic Science, Govt. Institute of Forensic Science, Nagpur, Maharashtra

Abstract

The advances in nanoparticles have vast applications in the field of Forensic Science such as in security documents, paints, examination of inks, chemicals & toxins, DNA analysis, Lab-on-chip, among others. They have also proved to be useful for the development of latent fingerprints. Distinct ridge details can be obtained by applying different nanoparticles such as gold, silver, silicon dioxide, zinc oxide, aluminum oxide, etc. Latent Fingerprint evidence is one of the important pieces of evidences found in many crimes. The use of new and better techniques may enable the development of fingerprints even on seemingly difficult substrates. This review focuses on different nanoparticles and their applications in the development of latent fingerprints.

Keywords: Nanoparticles, Latent Fingerprints, Ridge Details, Porous Surface, Nano-Forensics.

Fingerprint Analysis

REVIEW ON SEX DETERMINATION FROM FINGERPRINTS

Nazla Khalid[1]

[1]M.Sc. Forensic Science, Department of Anthropology, Delhi University

Abstract

Fingerprints are unique characteristics which help to establish the identity of an individual. No two fingerprint are alike thus useful technique for individualization. Fingerprints are the most commonly encountered trace evidence from a crime scene and can be latent, patent and plastic in nature. Dermatoglyphics is the scientific study of ridge patterns of the skin. The study of dermatoglyphics involves either qualitative or quantitative analysis. Qualitative dermatoglyphics focuses on, patterns of fingerprints and types of minutiae; while, ridge count and finger ridge density (RD) are examples of the finger-prints quantitative study. Epidermal ridge density can be determined by two parameters such as (1) ridge width and (2) distance between ridges. The thickness of the epidermal ridges varies between individuals, generally women have finer ridges than men and, therefore, greater ridge density within a given unit of space. The ridge densities were calculated using Bayer's equation. Researches have conducted the studies among Caucasian–American, Spanish, African–American, Southern Indian and Central Indian populations and similar trend of women tend to have higher ridge density compared to male. The studies show that ridge density will help the investigators to identify the gender of the perpetrators and thereby narrow down the possible suspects.

Keywords: fingerprints, dermatoglyphics, ridge density, sex determination, personal identification, ridge width.

Fingerprint Analysis

BIOMETRICS IN FORENSIC IDENTIFICATION

Ishika Shukla[1]

[1]BSc (2nd year) (2019-2022), Government Institute of Forensic Science, Nagpur

Abstract

Accurate and efficient identification have become a vital requirement for forensic application due to diversities of criminal activities. A recent advancement in biometric technology, which is equipped with computational intelligence techniques, is replacing manual identification approaches in forensic science. Biometrics is a fundamental verification mechanism that identifies individuals based on their physiological and behavioral features. These biometric expansions are easily observable in different forensic identification areas, e.g. face, fingerprint, iris, voice, handwriting, etc. Forensic Biometrics also overcomes the loopholes of traditional identification system that were based on personal probabilities. It is considered as a fundamental shift in the way criminals are detected. Biometrics is one of the most fascinating ways to solve the crime. It is an automated way to establish the identity of a person because of his or her physical (fingerprint, face, hand/finger geometry, iris, retina, ear, etc.) and behavioural characteristics (signature, voice, gait, odor, etc.). A biometric system is a pattern recognition device that acquires physical or behavioural data from an individual, extracts a salient feature set from the data, compares this feature set against the features set stored in the database and provides the result of the comparison. Accurate and reliable identification is an important issue in crime detection. The biometric recognition is emerging as a sound scientific justifiable tool in investigative procedure. It holds the potential to solve the criminal activities. Advances in biometric technology mean that biometrics will have a more marked impact in crime detection in coming future. However many improvements in the recognition systems can be expected if recent findings in applied mathematics, statistics and computer sciences are implemented in biometric science.

Keywords: biometrics, fingerprint, identification, physical characteristics, behavioural characteristics.

PHYSICAL DEVELOPER METHOD FOR DETECTION OF LATENT FINGERPRINTS

Abhinandan Kanjikar[1], Kaushik P M[1] and Prashanth Kumar H P[2]

[1]6th Semester BT, Department of Biotechnology, Sapthagiri College of Engineering, Bengaluru, Karnataka-560057

[2]Assistant Professor, Department of Biotechnology, Sapthagiri College of Engineering, Bengaluru, Karnataka-560057

Abstract

A new technique to detect latent fingerprints on dry and wet, porous items including paper articles, rubber gloves, nylon clothing and clay-based products for enhancing the identification. A solution containing iron salt reduces aqueous silver nitrate to finely divided metallic silver coupled with oxido-reduction process is the basis of mechanism. This process is like a photographic physical developer which, during processing of film rolls, undergoes a similar redox reaction, thus deriving its name from it. Dark gray or black images reveal the fingerprint due to the adsorption of metallic silver particles on the fatty acid and lipid components of sweat residue.

Keywords: latent fingerprints, iron salt solution, oxido-reduction, metallic silver, photographic image.

Fingerprint Analysis

ePoster Category

ORGANIC FOOD WASTE TO FINGERPRINT POWDER: FORENSIC GOES GREEN

Revathi Rajan[1] Sofia Haniza Md Zabit[2] Vanitha Devaraja[2]

[1]Faculty of Applied Sciences, UCSI University, Jalan Puncak Menara Gading 1, 56000 Cheras, Kuala Lumpur, Malaysia

[2]Faculty of Health and Life Sciences, Management and Science University, 40100 Shah Alam, Selangor, Malaysia

Abstract

Powder dusting technique is the most versatile latent fingermark development method, which can be enhanced through nanotechnology. The primary aim of this research was to synthesis nanoparticle based high-definition fingerprint developing powder from agriculture waste. Eggshells produced from local food outlets were subjected to stepwise thermal treatments, carbonization and calcination at 80℃ (2 hours) and 900℃ (3 hours), respectively. The efficiency of the powder for latent fingermark development was tested in two phases; multiple surface and multiple donor studies. The first phase tested the efficiency of powder in comparison to the commercial white powder (SIRCHIE), across varied non-porous surfaces followed by the second phase carried out using 150 random fingermark donors. The fingermark was graded based on the clarity of the ridges and scores were subjected to data analysis. Fine white calcium oxide powder was produced from the thermal treatment. Upon application on latent fingermarks, the synthesized powder exhibited high selectivity and sensitivity to fingermark residue resulting in the formation of clear ridge details. Independent t-test analysis of fingermark grades in Phase 1 ($t_{plastic}$ = -2.366, p-value = 0.031; t_{metal} = -0.849, p-value = 0.409; t_{glass} = -0.918, p-value = 0.372) revealed significant difference in development on plastic surface alone attributed to the adhesive property of the SIRCHIE. Meanwhile, phase 2 data (t_{male} = -3.809, p-value <0.001; t_{female} = -3.145, p-value = 0.002) showed that there were significant improvement in the clarity and contrast of the fingermarks developed using calcium oxide powder. Findings of this research may contribute to increase fingermark recovery in the crime scenes, as well as provide a safer and cost-effective alternative to the commercial white powder that contains titanium oxide pigment that are expensive and energy intensive production.

Keywords: Calcium oxide, nanoparticle, fingermarks, eggshells, organic food waste

Fingerprint Analysis
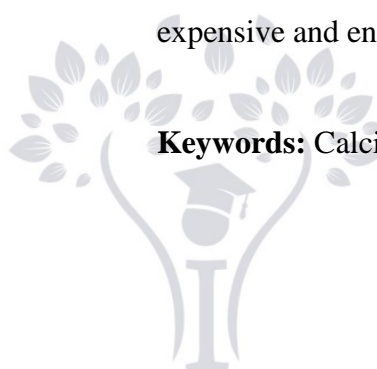
USE OF FINGERPRINT BIOMETRIC IN WORKPLACE DURING COVID TIMES: A CRITICAL VIEWPOINT

Dr.Yadukul. S[1], Dr.Pragnesh Parmar[2], Dr.Prashanth Mada[3], Dr.Divya Reddy P [4]

[1]Associate Professor, [2]Additional Professor, [3]Assistant Professor, [4]Senior Resident

AIIMS (All India Institute of Medical Sciences), Bibinagar, Hyderabad

Abstract

Biometrics is referred as biometric recognition due to the fact that a person can be automatically identified based on his/her physiological characteristics. Biometric systems have been widely used before the inception of computer in human activities. These systems make use of the physical or biological traits of human beings for recognition and authentication purposes. Most common biological traits or characteristics used are fingerprints, iris and face. Before the COVID-19 pandemic period, most of the Schools, Colleges, IT companies, Government & Private Offices had fingerprint biometric system to collect attendance of their Students/Employees. Fingerprint recognition is a secure and convenient technology that has become common and widespread, not only in smart phones, but in our everyday lives as well. However, the recent global outbreak of COVID-19 is raising questions about how safe using fingerprint authentication really is, as touching the sensors can potentially spread viruses. Our everyday lives are surrounded by many different types of surfaces that come in contact with countless people. These surfaces include the poles in buses and trains, elevators, ATMs, buttons on copy machines, door handles, handrails, tables, credit cards and money, to list but a few. In the wake of the COVID-19 outbreak, numerous news articles have claimed that there is a risk of infection via these commonly touched surfaces. In this poster, we will look into the different guidelines issued by the authorities related to the fingerprint biometrics & also explore the other alternatives that we have in the present day, to overcome the same in this COVID-19 period.

Keywords: Biometric, Fingerprint, COVID.

Fingerprint Analysis

FINGER KNUCKLE CHARACTERISTICS: A PROMISING BIOMETRICS

Arti Varshney[1], Garima Sagar[2], Sakshi Bisht[3]

[1]Sherlock Instittute of Forensic Science, India

[2]National Institute of Criminology and Forensic Sciences, New Delhi
[3]Indraprasth University, New Delhi

Abstract

Biometric authentication is a security process that relies on the unique biological characteristics of an individual such as fingerprint, retina scan, iris recognition etc. The basic premise of biometric authentication is that every person can be accurately identified by his or her intrinsic physiological characteristics or behavioral characteristics. Hand biometrics is based on geometric shape of the hand- size of palm, length and width of finger, distance between the knuckles etc. Finger knuckle print (FKP) or the finger knuckle characteristics are the pattern present on the outer surface of fingers i.e., at the finger phalangeal joint, these patterns have more obvious line features than the palm surface. Each individual has unique knuckle-prints. The uniqueness of a knuckle-print is exclusively determined by the local ridge characteristics and their relationships. Automatic knuckle-print matching depends on the comparison of these local ridge characteristics and their relationships to make a personal identification. An important step in knuckle-print matching is to automatically and reliably extract minutiae from the input knuckle-print images. The result of minutiae extraction depends on the quality of the input knuckle-print images. In such situations, the ridges can be easily detected and minutiae can be located from the thinned ridges. The ridge structures in poor-quality knuckle-print images are not always well defined so cannot be correctly detected posing some problems. It has advantages of easy acquisition and high resilience to spoof attacks and has been noticed to identify individual based on pattern.

Keywords: biometric, finger knuckle print, retina scan, fingerprint, minutiae, ridges.

Fingerprint Analysis

LASER TECHNIQUE FOR LATENT FINGERMARK DEVELOPMENT

Surajnarayansingh D. Kushwaha[1], Neeti Kapoor[2], Ashish Badiye[2]

[1]G.H.Raisoni University Amravati, Maharashtra

[2]Government Institute of Forensic Science, Nagpur, Maharashtra

Abstract

Laser technique is often used as a supplement to conventional procedures of latent fingermark detection. The fluorescence so produced provides intrinsic high sensitivity such that fingermarks may be detected on difficult and unusual substrates. It also enables detection of very old fingermarks. This review focuses on the various aspects of the use of Laser technique for latent fingermark development.

Keywords: Fingerprint, Laser Detection, Fingermark, Latent Print, Print and impression.

CLONING OF A FINGERPRINT

[1]Anirudhvaibhav Gupta

[1]B.Sc. (H) Forensic science second year (Batch 2019-22), Amity University,
Noida Uttar Pradesh

Abstract

Fingerprints are unique patterns, made by friction ridges and furrows, which appear on the pads of the fingers and thumbs. Prints from palms, toes and feet are also unique; however, these are used less often for identification, so it focuses on prints from the fingers and thumbs. Friction ridge patterns are grouped into four distinct types—loops, whorls, arches and composite—each with unique variations, depending on the shape and relationship of the ridges. The aim of the study is to learn about the process of cloning of a fingerprint, its requirements and complications, how to avoid such kind of hacking on personal level and as well as on digital level. In the study, a mould of a finger was created using adhesive hot glue and gelatine leaves or fevicol to make the fingerprint. The limitation of the cloning to create an artificial finger using a mould requires the legitimate user's actual finger. The artificial finger was tested on fingerprint scanners of several mobile phones and laptops as well and the results came out to be positive, but the test rate was not very high until proper mould was made and a good technique to do it was learned. This cloning is quite easily detected by the user whose finger is being copied. A person planning to break into a system using a fingerprint scanner should have a very credible story to convince someone to stick his or her finger in hot glue. The cloning works best when the adhesive solution is thick enough and least number of bubbles in the moulded finger and use of more than one mould to create a different finger.

Keywords: Fingerprints, cloning, gelatin, fevicol, moulded finger.

IR- LASER ABLATION TECHNIQUE: A METHOD OF ANALYSING FINGERPRINTS

Meenal Goswami[1]

[1]MBA Forensic Accounting, National Forensic Sciences University, Gandhinagar

Abstract

Fingerprints left behind at the crime scene can be developed by using various conventional and advanced techniques, but they do not reveal the information related to the chemical components present on their surface. A team of Chemists at Louisiana State University LA, USA developed a new technique to identify these components with the help of laser ablation. It is the method for mass spectrometry, which combines laser ablation with infrared ray which can be used on the surface with different porosity such as glass, plastic, cardboard, aluminium. Laser can remove complete material from the substrate (initially enhanced with powders, usually black powder) by heating it through targeting a beam of ray at particular spot, integrated with vacuum capture with syringe filters and then analyse the vacuumed material with spectrometric methods to determine the mass of the compound(s) present. Hence revealing the activity of the person involved. In their study chemists worked on analysis of caffeine, condom lubricants, explosives on the surface of fingerprint with the help of Matrix-Assisted Laser Desorption Ionization (MALDI) imaging. GC-MS has been used to analyse the explosives on the fingerprints.

Keywords: MALDI, Laser Ablation, Infrared, Fingerprints, Spectrometry.

Fingerprint Analysis

CONTACTLESS FINGERPRINT SYSTEM

Neelkamal Ganesh Battu[1]

[1]National Forensic Sciences University, Gandhinagar, Gujarat

Abstract

Since early 2020, the COVID-19 pandemic has had a considerable impact on many aspects of daily life. A range of different measures have been implemented worldwide to reduce the rate of new infections and to manage the pressure on national health services. A primary strategy has been to reduce gatherings and the potential for transmission through the prioritisation of remote working and education. Enhanced hand hygiene and the use of facial masks have decreased the spread of pathogens when gatherings are unavoidable. Fingerprint recognition systems are widely used in the field of biometrics. Many existing fingerprint sensors acquire fingerprint images as the user's fingerprint is contacted on a solid flat sensor. Because of this contact, input images from the same finger can be quite different and there are latent fingerprint issues that can lead to forgery and hygienic problems. For these reasons, a touch less fingerprint recognition system has been investigated. This poster strives to throw light to switch over the use of contactless biometric system.

Keywords: COVID, contactless, fingerprint system, ridges, recognition systems.

COMPREHENSIVE DERMATOGLYPHICS STUDY ON RIDGE DIMENSIONS, PORE SIZE AND ASSESSMENT OF THE SWEAT COMPOSITION AMONG THE INDUSTRIAL WORKERS

Heenaba Jadeja[1], Dr. Rajesh Babu[1]

[1]National Forensic Sciences University, Sector-9, Gandhinagar

Abstract

Every individual has unique fingerprints. The cross section of finger would look like the cross section with ridges and furrows. Ridge morphology and morphometry are anatomical ridge individualization used in identification of victim or criminal in forensic science. The ridges have pores along their entire length that exudes perspiration. The perspiration contains different components depending on the environment, occupation, food intake and habits. Study of the sweat composition can narrow down the search for the identification of an individual. This is a unique approach to study the fingerprints of individuals, which can be important concerning the identity of an individual. The study has been conducted on 20 samples taken from the people working in the pigment industry. In Dinolite analysis, a significant increase in the dimensions of pore size and ridge width of the pigment industrial workers was more than the normal individuals due to the muscular activities. In FTIR analysis for the collected samples, molecules like $N=O=C$, $C-N$ and $C-X$ are present in the sweat samples of the pigment industry workers which are also present in the dye and absent in the sweat samples of the normal individual. From this we can conclude that the identification of the individuals on the basis of their occupation can be narrowed down.

Key words: fingerprint, sweat composition, pigment industries, workers, occupation.

Fingerprint Analysis

FINGERPRINTS FROM DECEASED

Anjali Tamgadge[1]

[1] M.Sc. Forensic Science I Year (Batch 2020-22), Government Institute of Forensic Science Nagpur, Maharashtra

Abstract

Fingerprints have been proven to be the best evidence for identification and individualization in forensic world. Fingerprints are not something new to humans as it is been in use intentionally or unintentionally since very ancient Babylonian culture. The area of fingerprint has shown a great development in collection, developmental techniques, analysis, classification, individualization and now into the digital world. It has become a process for personal identification in everyday life and with this popularity now, it has become the backbone of every investigation. Fingerprints whether from dead or living is of equal importance, these two only differs in manner of collection of fingerprint. Many a time's collection from dead found to be very cumbersome process depending upon the stage at which the deceased is encountered for collection of fingerprints. Presence of rigor mortis and later decomposition state increases the difficulty of this collection. However variety of procedure is employed for successful collection of fingerprints from deceased and further for their individualization.

Keywords: Fingerprint, Living, Dead, Rigor Mortis, Decomposition, Deceased.

RELIABILITY OF UNCONVENTIONAL METHODS OF DEVELOPING FINGERPRINT

Sukriti Ghanash[1], Pushkar Yadav[1]

Sam Higginbottom University of Agriculture, Technology and Sciences, Prayagraj

Abstract

Analysing fingerprints left at the scene of a crime is one of the most critical part of forensic analysis. Fingerprint is an impression left by the friction ridges of a human finger. Light and dark areas of fingerprint pattern are known as ridges and valleys. It is said to be most versatile but fragile evidence found at crime scene. In the present scenario, various types of modus operandi for committing crime have been emerged very high in our society. Although, the modern and advanced technologies have facilitated us for investigation and identification of the suspect. The investigative techniques evolve the traditional and moderate methods for the succession of cases and exist in the tradition of practice. Among of all evidences, the latent prints are most often at crime scene and frequently encountered which takes the most efficacious and effective part in solving the most puzzled cases. Instead of using the traditional methods, if some unconventional methods could be used, which have higher significance in latent prints development and identification; will be a great help in forensic investigation. In this study we have studied some research papers on internet and every research work using unconventional methods for development of fingerprint was successful at a very high rate. For the development of prints present at various surfaces, four unconventional methods (turmeric powder, gram flour, coffee powder, vermillion, henna, corn flour etc.) were used. The developed prints were clear, identifiable which were having all the information (individual and class characteristics) about an individual to be nabbed. The main purpose of using these unconventional methods are because of their massive advantages which are: easily available, cheap, and non-carcinogenic.

Keywords: non-carcinogenic, unconventional, fingerprint, henna, vermillion, traditional methods.

Fingerprint Analysis