



INTERNATIONAL ASSOCIATION  
OF SCIENTISTS & RESEARCHERS

27<sup>th</sup> -28<sup>th</sup> March 2021

eConference  
Proceedings

**3<sup>rd</sup>** INTERNATIONAL eCONFERENCE-2021  
**Document Examination**

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## 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 International eConferences are 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 3<sup>rd</sup> International eConference on “Document Examination”, 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”.*



## SPEAKER'S PROFILE

### JOHN PAUL OSBORN



Certified Forensic Document Examiner  
Osborn & Son, USA

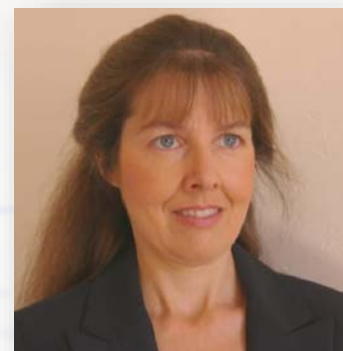
John Paul Osborn is a Forensic Document Examiner and maintains an office in Middlesex, New Jersey. He was trained under the supervision of his late father, Paul A. Osborn, as a member of the four-generation family practice founded by his great grandfather, Albert S. Osborn, around 1910. He is currently a member of the American Academy of Forensic Sciences, the American Society of Questioned Document Examiners (for which he served as President from 2014 through 2016), the Northeastern Association of Forensic Scientists the New Jersey Association for Forensic Scientists, and the American Society for Testing and Materials. His work has been published in the Journal of Forensic Sciences and he was Editor of the American Society of Questioned Document Examiners Newsletter from 1991 through 1997.



### HEIDI H. HARRALSON

Forensic Document Examiner  
Spectrum Forensic International, LLC, Tucson (Arizona)

Heidi Harralson, M.A., CDE, D-BFDE holds a Master's degree in Handwriting Science & Forensic Document Examination, Prescott College, Prescott, Arizona. She is a forensic document examiner with Spectrum Forensic International, LLC in Tucson, Arizona. A certified forensic document examiner with over 25 years of experience, she is board certification with the Board of Forensic Document Examiners through FSAB. She has many affiliations in professional organizations and currently affiliated with Australia and New Zealand Forensic Science Society (ANZFSS) as general member and National Association of Document Examination (NADE) as Board Certified and Diplomate Member. She is also giving services in professional organization like Certification Chair in National Association of Document Examiners, Secretary in International Graphonomics Society.







## SPEAKER'S PROFILE

### **K V RAVI KUMAR**

Pro-Vice Chancellor  
Rashtriya Raksha University, Gujarat



K V Ravi Kumar currently holds the position of Pro-Vice Chancellor at Raksha Shakti University. He was deputed by RRU as a member of the delegation to explore academic exchange and research with the Universities of Southampton, Southampton Solent, Portsmouth, and Jil Dando Institute of University College of London, UK. He earlier worked as OSD (Plan Projects) with Joint Secretary, Police Modernization, MHA, Government of India. He was deputed by Govt. of India to prepare the project proposals of Countries like Maldives, Vietnam, and Seychelles to setup and modernize their forensic science setup. He has attended International Forensic Science Technology Symposium, in Mexico, advanced Hi-Tech Training at FBI, Laboratory Quantico, Virginia, USA, and visited Forensic Science Service Laboratory at Birmingham and London.

### **DR. AJAY SHARMA**

Director  
Forensic Science Laboratory, Jaipur, Rajasthan

Dr. Ajay Sharma is currently serving as Director, State Forensic Science Laboratory, Jaipur, Rajasthan. He is actively involved in examining numerous cases pertaining to forgery, security documents, bank cheques case belonging to CBI Delhi Police, Rajasthan Police, Judiciary, Army, Central, and State government departments. He is also an active member of the Board of Studies in the Forensic Science Department, Bundelkhand University, Sardar Patel University of Police Security and Criminal Justice, Mody University, Rajasthan. He has awarded with best scientific paper awards by DFS, MHA, Government of India. He has also appreciated his outstanding efforts by Principal Secretary, Deputy Secretary, Rajasthan, and many more.





## **SPEAKER'S PROFILE**

### **MOHAMED ABO ELAZM**



**Forensic Document Examiner  
Egypt**

Mohamed Abo Elazm is a Police Colonel at Borg El Arab Airport in Alexandria Head of Forensic Evidence, Egypt. He works in inspection of security documents and has detected hundreds of fraud cases. He has obtained training from the International Organization for Migration, the German Police, the American Consulate the Institute of Forensic Science in Cairo.



### **MICHAEL N. WAKSHULL**

**President, Document Examiner  
Q9 Consulting, Inc., Temecula, CA**

Mike Wakshull, president of Q9 Consulting, a civil and criminal court-qualified document examiner, partners with legal clients to provide a comprehensive forensic investigation of the evidence presented in handwritten and computer-generated questioned documents of all types. He is based in Temecula, CA USA. He applies a strong math and science background to his investigations. He offers a science-based approach to forensic document examination, providing solid, quantifiable evidence to present in court. Cases worked include signature and handwriting authentication, the examination of altered documents, the examination of electronically produced documents, graffiti, and other forms of documents. As a member of the Scientific Association of Forensic Examiners (SAFE) and National Association of Document Examiners (NADE), he subscribes to their strict code of ethics. The Q9 Consulting supports the new code of ethics proposed by the National Commission on Forensic Science.





## SPEAKER'S PROFILE

### **BULENT AYDOGMUS**



**Forensic Document Examiner**  
**Directorate of Forensics Services, Himachal Pradesh**

Bülent AYDOĞMUŞ graduated from the Department of Security Sciences in 1995. He received his Master's Degree from the Forensic Science Institute of Çukurova University in 2004. He worked as a Forensic Document Examiner in various ranks of The Criminal Police Laboratories. During his duty, he contributed to solving 4,000 to 5,000 cases by examining tens of thousands of vouchers, checks, contracts, suicide letters, ransom letters, falsified documents, identity cards, passports, driving licenses, banknotes, etc. He has been awarded appreciation and acknowledgment certificates from various foreign institutions (mainly the OSCE, KPD, KFA) and local institutions for his training and seminars both abroad and in Turkey. He retired in January 2018 but he continues his specialization by doing examinations, consultancy, and educational purposes privately.



### **MOHINDER SINGH**

**Former Government Examiner of Questioned Document**  
**Central Forensic Science Laboratory**

Mohinder Singh is a former Government Examiner of Questioned Documents. He has been associated with the field of forensic examination for the last about 44 years. He has worked as a Forensic Document Examiner in laboratories of Government Examiner of Questioned Documents Shimla and Hyderabad under the administrative control of the Directorate of Forensic Sciences, Government of India. He has dealt with more than 4000 criminal and civil cases referred by various investigating agencies including CBI, Govt. Departments and various courts of law and tendered evidence in more than 1000 cases. He has also participated in the recent 19th Wroclaw Symposium on Questioned Document Examination, Poland in 2020. There are numerous national and international paper publications under his name. He is a Lifetime Membership of the Indian Academy of Forensic Sciences and Indian Science Congress Association.



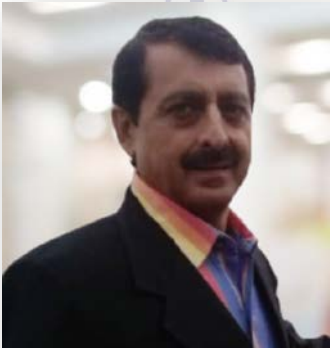




## SPEAKER'S PROFILE

### DEEPAK HANDA

Principal Scientific Officer, Former HoD  
Central Forensic Science Laboratory, CFSL CBI Delhi



Deepak R Handa is Principal Scientific Officer (Eq. Deputy Director) and Former HoD Documents at the Central Forensic Science Laboratory, CFSL CBI Delhi. He has more than 36 years of experience in the domain of handwriting examination including the examination of handwriting & signatures, detection of forgery, examination and detection of secret writing, ink and paper examination, photocopied documents examination, currency notes, and passport examination etc. He has examined more than 4 lacs of case exhibits and provided opinion to various criminal, civil, and court cases. He has also tendered evidence in more than 1500 courts across India without even getting disbelieved even for a short instance and giving promising reports. He has written and co-authored more than 50 research papers in journals of national and international repute.



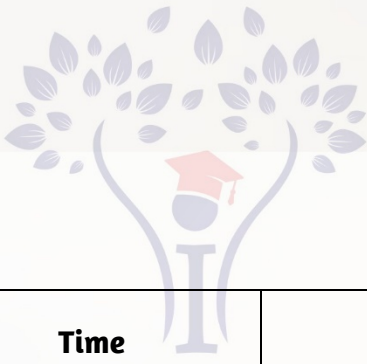
### AL-SHARIF HASHEM MOGAHED

Forensic Document Examiner, ASQDE, ASFDE  
Ministry of Justice, Egypt

Al-Sharif Hashem Mogahed is currently serving as a forensic document examiner in the Ministry of Justice, Egypt. He has completed his master's in Physical chemistry. He undergoes numerous training from INTERPOL on Security Document Examinations, Watermarks in Security Documents, machine Readable Zone in Security Documents, Identifying a person in a facial photograph, etc. He is an active member of the Australian Society of Forensic Document Examiners, the American Society of Questioned Document Examiners, the Arab Society for Forensic Science and Forensic Medicine, etc. He presented various professional presentations at different conferences and meetings. He has also conducted numerous teaching courses and workshops as a trainer at the National Center of Judicial Studies (Egypt) for forgery and Counterfeiting Experts, Visiting instructor at AlFayoum University, Beni-Suef University, etc.







**Day 1: 27th march 2021**

<b>Time</b>	<b>Topic</b>	<b>Keynote Speaker</b>
10:30 to 11:00 AM IST	The Pursuit of Justice: The Value of Generally Accepted Standards and Public Transparency	John Paul Osborn
11:00 to 11:30 AM IST	Forensic Handwriting Examination in the Digital Age	Heidi Harralson
11:30 to 12:00 PM IST	Instrumental Methods of Analysis in Document Examination	K V Ravi Kumar
12:00 to 12:30 PM IST	Relevance and Significance of Standard Documents in Forensic Document Examination	Dr. Ajay Sharma
12:30 to 01:00 PM IST	How to Inspect Documents & The Insurance Features	Mohamed Abo Elazm

**Day 2: 28th march 2021**

10:30 to 11:00 AM IST	Little Known Facts About Examination of Altered Documents	Michael Wakshull
11:00 to 11:30 AM IST	Security Documents and International Standards	Bulent Aydogmus
11:30 to 12:00 PM IST	Emerging Trends & Challenges in Questioned Document Examination	Mohinder Singh
12:00 to 12:30 PM IST	Examination of Photocopied Documents & Their Relevance in Court of Law	Deepak Handa
12:30 to 01:00 PM IST	Identification and Evaluation of Digital Printing Inks for the Forensic Purposes	Al-Sharif Hashem Mogahed

# Chairing Panel Day 1

3<sup>rd</sup> INTERNATIONAL eCONFERENCE-2021  
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**Prof. KOMAL SAINI**

Department of Forensic  
Science, Punjabi University



Chairperson

**Dr. SUMIT CHOUDHARY**

Rashtriya Raksha University,  
Gujarat



Chairperson

**Dr. VISHAL SHARMA**

Institute of Forensic Science  
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Co-Chairperson

**Dr. KRITI NIGAM**

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



# Chairing Panel Day 2



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Forensic Science Laboratory  
NCT of Delhi



Chairperson

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Central Forensic Science Laboratory,  
CBI, New Delhi



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**HEENA GOSWAMI**

Gujarat National Law University,  
Gandhinagar

# Chairperson Day 1

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## Chairperson

**Dr. RITESH Kr. SHUKLA**  
School of Arts and Sciences,  
Ahmedabad University,  
Ahmedabad

**PROFESSIONAL  
CATEGORY**

PAPER PRESENTATION



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**E. SAI PRASAD CHUNDURU**  
Central Forensic Science Laboratory,  
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**PROFESSIONAL  
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Forensic Science Laboratory,  
Uttar Pradesh



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## Chairperson

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State Forensic Science Laboratory,  
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Senior Forensic Expert,  
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Sam Higginbottom  
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Technology and Sciences,  
Prayagraj



**Dr. Swapnil Gupta**

Central Forensic  
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Kamrup



**Dr. Ashish Badiye**

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Forensic Science,  
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**Prashant Sharma**

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**Dr. Jaskaran Singh**

Allied Health Sciences,  
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Gr. Noida



## STUDENT CATEGORY

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Gurgaon



**Dr. Jassy Anand**

Forensic Questioned  
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**Dr. Malvika Mehta**

Forensic Investigator  
& Consultant,  
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**George Dixon**

Assistant Superintendent  
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Jamaica

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Forensic &  
Handwriting Expert,  
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USA



**RAJ SRIVASTAVA**  
Forensic Science Laboratory  
Sagar

# Core Committee

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**RAMANDEEP SINGH**  
Evolve Security



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International Hand Analyzing  
Consultancy, Sri Lanka



**HANSI BANSAL**  
Government Institute of Forensic  
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# Organising Committee

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International Association  
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Convener in Chief

**PHANEENDAR B. N.**

Chairman  
Clue4 Evidence Foundation



Convener

**Mahesh Sharma**

SIFS India



Convener

**Sheza Azeen**

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SIFS India



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**Priya Singh**



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**Sheetal**



Organising Secretary

**Aditi**



Organising Secretary

**Falak Khan**

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# Scientific Committee

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**BULENT  
AYDOGMUS**

Forensic Document Examiner  
Sahtecilik Grafoloji Uzmani



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Directorate of Forensic  
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Forensic Geneticist



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Kean University



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KAITHOLIA**

Forensic Science  
Laboratory, Sagar



**SUBHASISH SAHOO**

Forensic Science  
Laboratory, Bhubaneswar



**ZADIA-KAY SMITH**

Jamaica Constabulary Force

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**Dr. POOJA PURI**  
Amity University  
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**Dr. ANU SINGLA**  
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**Dr. VIJAY ARORA**  
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**NEERAJ KUMAR  
VARSHNEY**  
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Laboratory, Patna



**Dr. PRAGNESH  
PARMAR**  
AIIMS,  
Bibinagar



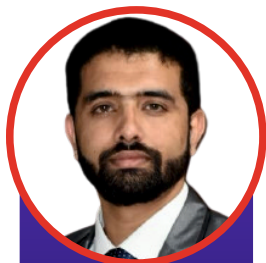
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P. PILLAI**  
Govt. Dental College and  
Hospital, Ahmedabad



**Dr. JANITA JASUJA**  
National Forensic  
Sciences University



**MEBIN WILSON  
THOMAS**  
JAIN  
(Deemed-to-be University)



**SEEMA PATEL**  
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National Centre for  
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SHARMA**  
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University, Gujrat



**Dr. UTSAV PAREKH**  
P S Medical College  
Gujarat



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Forensic Science  
Laboratory, Rohini, Delhi



**Dr. MUKESH  
SHARMA**  
State Forensic Science  
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**Dr. JAHANGIR  
IMAM**  
Directorate of Forensic  
Science Services, Ranchi



# Scientific Committee

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**Dr. NEERAJ  
TANEJA**

Mobico Comodo Pvt. Ltd.  
Gurgaon



**GUNVANTI  
RATHOD**

AIIMS,  
Bibinagar



**Dr. PREETI SINGH**

National Post Graduate  
Autonomous College



**VINNY SHARMA**

Galgotias University,  
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**Dr. JAGADISH  
P. RAJGURU**

HI-Tech Dental College &  
Hospital, Bhubaneswar



**VICHAR MISHRA**

Jain  
(Deemed-to-be-University),  
Bengaluru



**VIJAY Kr. YADAV**

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Jhansi



**MADHURI VAGAL**

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Mumbai



**Dr. VIVEK  
SAHAJPAL**

State Forensic Science  
Laboratory, Shimla



**Dr. KRITHIKA  
RAJESH**

Forensic Science  
Laboratory, Ahmedabad



**JIN LEE**

Independent  
Lawyer



**SUCHISMEETA  
BEHERA**

Forensic Science  
Laboratory, Odisha



**KALPESH SOLANKI**

Rashtriya Raksha  
University, Gujrat



**Arvind Sud**

Senior Forensic Expert,  
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**Dr. Vaibhav Saran**

Sam Higginbottom  
University of Agriculture,  
Technology and Sciences,  
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# Scientific Committee

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**Dr. Jaskaran Singh**  
Allied Health Sciences,  
Sharda University,  
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**Abhishek Vashisth**  
Forensic &  
Handwriting Expert,  
Dehradun



**Dr. Jassy Anand**  
Forensic Questioned  
Document Examiner,  
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**Dr. Inderjit Singh**  
Senior Forensic Expert,  
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**Dr. Ali Raza**  
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**Prashant Sharma**  
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**Vijay Rustagi**  
Senior Forensic Expert,  
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Institute of Forensic  
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**Dr. Priyanka Singh**  
Amity Institute of  
Forensic Sciences,  
Amity University, Noida



**Heena Goswami**  
Gujarat National  
Law University,  
Gandhinagar



# Call for Paper

**3<sup>rd</sup>** INTERNATIONAL eCONFERENCE-2021  
**Document Examination**

## 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, **20th March 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' (mandatorily).
- ▶ 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.

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# Call for ePoster

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- ▶ 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, **20th March 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**.

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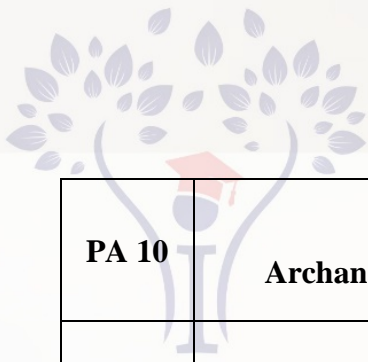




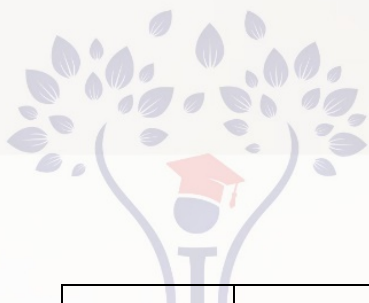
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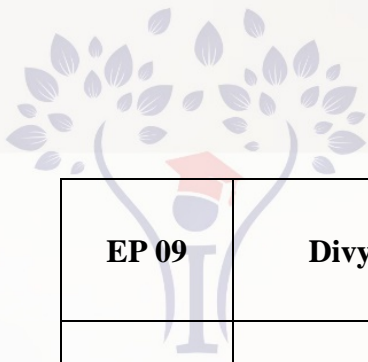
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**3<sup>rd</sup>** INTERNATIONAL eCONFERENCE-2021  
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### **PERSON IDENTIFICATION FROM CHARRED DOCUMENTS. BURNED A FEMALE TEACHER FOLLOWING THE HOMICIDE, A RARE CRIME CONCEALMENT REPORT**

Prof. T. Nataraja Moorthy<sup>1</sup>

<sup>1</sup>Professor of Forensic Sciences, Faculty of health and Life Sciences, Management and Science University, Shah Alam, Selangor, Malaysia. Email: natrajamoorthy@rediffmail.com

#### **Abstract**

For corpse's disposal after homicide, perpetrators used to bury or burn for concealment. The present case study is a crime scene investigation by the author (hereafter as "TN"), former Crime Scene Investigator in Tamil Nadu Forensic Sciences Department, India. A 3-month pregnant school teacher aged 24 years was kidnapped on the way from her school, murdered and the body was burned near a village cremation ground. As Police's request, TN visited the cremation site, and the accompanied police officer said that no evidence found in the burned site. On examination, TN observed some charred document pieces, two metal rings, and bony fragments among the ashes. Examination of the charred pieces revealed the presence of some English words, appeared in English books and metal rings were the part of a shoulder bag. Then he proceeded to the teacher's school and enquired the headmistress. On the kidnapping day, Saturday forenoon, she had handled English and mathematic classes, and she always used her shoulder bag with teaching books of the day. The words from charred pieces were found in English book also. The collected physical evidence was then sent to Forensic Science Laboratory for analysis. The anthropological report showed that the bone pieces were female origin, aged about 20 years. Crime reconstruction based on report confirmed that the school teacher was murdered after kidnap and burned. On further enquires, the police arrested the deceased's parents and relatives who were responsible for this crime and concealment. It was an inter-caste marriage, and the teacher married the boy, a poor and schedule caste, against parent wishes. As an expert witness, TN attended the session court and presented his testimony in the court. Finally, the Honorable Judge accepted the forensic evidence, and sentenced her father's imprisonment with two relatives while her mother was acquitted. This is the one and only charred document case received in Tamil Nadu Forensic Sciences Department. TN was awarded by the Tamil Nadu Police and Forensic Sciences Department for this exemplary crime scene work and solved the mystery using charred document.

**Keywords:** Crime Scene Report, Homicide, Cremation, Charred Document, Identification.

**DOCUMENTATION OF MEDICAL RECORD IN DAY-TO-DAY MEDICAL PRACTICE**

Dr.Mukesh Kumar Meena<sup>1</sup>, Dr.Sanjay Kumar Jain<sup>1</sup>

<sup>1</sup>Jhalawr Medical College Jhalawar (Rajasthan)

**Abstract**

Proper documentation of medical record promotes patients' and physicians' best interests for many reasons. Recording all relevant data of a patient's care helps physicians monitor what's been done, and curtails the risk of mistakes scrambling into the treatment process. Systematic medical records document basic facts about the patient's health care delivery system, including who did what, and what results occurred. Improper documentation on the other hand may invite medical litigation at any point of time. Sound record keeping also plays a role in quality assurance practices; hence medical litigation can be avoided.

**Keywords:** Medical record, medical litigation, documentation, critical review documentation of medical record in day-to-day medical practice.





## COMMON CHARACTERISTICS OF DISGUISED SIGNATURES: A PRELIMINARY STUDY

Surajnarayansingh D. Kushwaha<sup>1</sup>, Poonam Moon<sup>2</sup>

<sup>1</sup>G.H.Raisoni University Amravati, Maharashtra

<sup>2</sup>Government Institute of Forensic Science, Nagpur, Maharashtra

### Abstract

Disguised writing is a type of writing in which the person wilfully attempts to mask his identity by making some modifications in his handwriting. It is generally found in cases of forgery, kidnapping, blackmailing, etc. The study was carried out on 75 healthy adult individuals from Nagpur region. Characteristics of disguised handwriting were studied using handheld illuminated Microscope. Differences in the control and disguised samples were observed in seven characteristics viz. letter size, slant, angularity, alignment, word spacing, initial capital letter and fluency of writing. It was concluded that the individuals who try to disguise their handwriting are not consistent and successful in fully disguising their handwriting.

**Keywords:** Document, Handwriting, Disguised writing, Individual characteristics, Class characteristics.



## **IMPACT OF DIFFERENT BODY POSTURE ON HANDWRITING- ANALYSIS USING ONE-WAY ANOVA**

Ipsita Sahoo<sup>1</sup>

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Sahooipsita1996@gmail.com

### **Abstract**

In the world of business and literacy most of the transactions take place through document consequently, documents are assuming an increasingly important role in our society. Falsification of document is also on the increase. Roughly seventy percent of the physical evidence is related to disputed documents. Not only the investigator should have knowledge of various types of questioned documents, the problems of document examination, the care and preservation of documents, he should also have the knowledge of handwriting and its various aspects for understanding the nature of writing and writer. Handwriting is a complex motor skill combining sensory neurological and physiological impulses. Handwriting has unique features and is inimitable to every individual which can be used for personal identification. It is considered as a supportive evidence of information for forensic examination. Variation in handwriting is the primary principle of handwriting examination. Therefore it is essential to resolve these primary elements and habits of writing with an accurate range of variation. Body position of a writer has significant impact on the handwriting while writing, the pressure applied with pen on paper will be different depending on whether a person is sitting, standing or moving. The approach to notice whether a person's body is free from all the perspectives or there is any burden on the writing hand is important. In this context, this study was carried out with the hypothesis that different body positions like standing, sitting and leaning during writing significantly affects the characteristic features of handwriting of a writer.

**Keywords:** Handwriting, Natural variation, Posture, Characteristics, Examination.

## **HANDWRITING DISCRIMINABILITY OF HINDI MEDIUM AND ENGLISH MEDIUM STUDENTS OF UTTAR PRADESH: A COMPARATIVE APPROACH**

Deepika Dubey<sup>1</sup>

<sup>1</sup>Research Scholar, Amity University, Gurugram

### **Abstract**

Handwriting of an individual is his acquired neuromuscular activity. It is the image of an individual's personality. The study of handwriting of a person may reveal the educational background of any person as well. Present study was conducted to scrutinize whether there is any distinction between the writings of Hindi medium and English medium students. For conducting this study, 100 subjects (50 of Hindi medium and 50 of English medium) were selected randomly of age range of 18-40 years from different regions of Uttar Pradesh. The primary concern of this study is to find the educational background of a person by virtue of his or her handwriting and to develop an exclusion method to exclude a person from a group of suspected people.

**Keywords:** Handwriting, Educational background, Hindi Medium.





## **USING RELATION BETWEEN PEN PRESSURE AND SPEED TO MANUALLY CALCULATE PEN PRESSURE FOR ANY AUTHOR**

Nidhi Sagarwal<sup>1</sup>, Mohit Soni<sup>1</sup>

<sup>1</sup>Lovely Professional University, Jalandhar - Delhi, Grand Trunk Rd, Phagwara, Punjab

### **Abstract**

Pen pressure is a highly unique individual characteristic but its potential has not been fully utilized in manual document examination especially author-identification. It has been observed that over the years, researchers and experts have suggested a number of techniques and devised dedicated experiments with elaborate equipment's in an attempt to calculate pen pressure. However, none of these techniques have been found to be simple and robust enough to be utilized in the field, for routine processing of a document evidence. This paper uses the relation between pen pressure and speed of a writer, to mathematically calculate the amount of stress being applied by the writer on the writing surface. For this study, samples were collected from 15 individuals. Each of these individuals were given regulated controlled conditions for writing their handwriting samples. The total time taken per author, was noted. These values were utilised to calculate pen pressure. It was found that the values of pen pressure remain similar for an author even if samples are taken at different times and on separate occasions.

**Keywords:** Pen pressure, Individual characteristic, Handwriting examination.

## A COMPREHENSIVE STUDY ON THE SECURITY FEATURES OF NEW INDIAN CURRENCY NOTES

Praveen Toraty<sup>1</sup>, E.Mohan<sup>1</sup>

<sup>1</sup>Department of Forensic Science, Aditya Degree College, Surampalem, Andhra Pradesh,  
India

### Abstract

Currency notes have security features through which one can identify the authenticity of the note. Currency notes bear a certain worth based on the denomination and are signed & sealed by the Governor of the issuing bank. Currency notes are prone to duplication which is a crime. These crimes are committed to gain illegitimate profits out of counterfeiting. To avoid such kind of crimes, currency notes are designed to be uncopyable with many security features. Though counterfeit currency still circulates among public transactions, most of the times it is unidentified due to inadequate knowledge in the public about the security features embedded in the currency notes. Not only higher denominations like ₹2000 & ₹500, Currency notes like ₹10, ₹20, ₹50, ₹100 & ₹200 are also susceptible to the counterfeiting. This is a comprehensive study on the security features of new Indian currency notes. In this study, Video Spectral Comparator (VSC) was used to identify various security features of the currency notes under different Electromagnetic Radiations (EMR) such as UV, Visible Narrowband lights and IR radiations with transmitted, oblique and incident lights. The results obtained are comparative differences between all denominations of new Indian currency notes. This study helps to provide a quick database reference for forensic document examiners, bank officials, and even for common people for identifying counterfeit currency notes.

**Keywords:** Counterfeit Currency, Legitimate Currency, Security features, Forensic Document Examination and Authentication.

## BANK OF JAMAICA FIVE THOUSAND DOLLAR CURRENCY NOTE

Zadia-Kay Smith<sup>1</sup>

<sup>1</sup>Sherlock Institute of Forensic Science, India

### Abstract

In many different areas of society, counterfeit products circulation is on the rise. Currency note is no exception. Over the last decade, the Questioned Document Section of the Jamaica Constabulary Force has seen a significant increase in cases related to counterfeit currency notes. This study aims to investigate the methodology of detecting counterfeit notes in Jamaica. This paper highlights various security features of the Bank of Jamaica currency note specifically the \$5000 denomination. This paper analyse methodology used to investigate counterfeit currency notes. The video spectral comparator (VSC40), Digital Microscope and a Magnifier were used in this analysis which took place in the Questioned Documents Laboratory of the Jamaica Constabulary Force. Bank of Jamaica currency notes are issued in Five (5) denominations namely \$50, \$100, \$500, \$1000, and \$5000. The front of these notes carries either a National Hero of Jamaica or a former Prime Minister whilst the back of the notes carries a local scenery or popular landmarks. These currency notes are the same size measuring (143 X 68 mm) and has a watermark portrait that is unique to each of these notes. They also carry unique security features that are visible only under ultraviolet light source. They contain serial numbers that can be seen at the front of each note running both vertically and horizontally to the left and right, respectively. No two note carries the same serial number. The printing date as well as the signature of the Governor of the Bank of Jamaica can also be seen at the front of each note. The \$5000 note bears the portrait of The Rt. Honourable Hugh Lawson Shearer. If after an examination is conducted and one of the features from any of the above-mentioned currency note is found to be missing, then such note is deemed to be a counterfeit of the genuine Bank of Jamaica currency note.

**Keywords:** Bank of Jamaica, Denominations, Security Features, Video Sprechtral Comparator (VSC40), Digital Microscope, Magnifier, Counterfeit.



## **TO STUDY CLASS AND INDIVIDUAL CHARACTERISTICS OF HANDWRITING OF PEOPLE FROM DIFFERENT PROFESSIONS**

Samiksha Landge<sup>1</sup>, Dr. Ashish Badiye<sup>1</sup>, Dr. Neeti Kapoor<sup>1</sup>

<sup>1</sup>Govt. Institute of Forensic Science, Nagpur

<sup>2</sup>HOD & Asst. Professor, Govt. Institute of Forensic Science, Nagpur

<sup>3</sup>Asst. Professor, Govt. Institute of Forensic Science, Nagpur

### **Abstract**

This paper focuses on studying the handwriting characteristics of personnel's from different professions. The data was collected from both males and females from professions like engineers, doctors and teachers and studied. The study was conducted on handwriting samples consisting of 100 samples (50 male and 50 female) from each profession mentioned earlier. The examination of these samples shows that people from different professions show some similarities and differences in their class and individual characteristics of handwriting.

**Keywords:** Handwriting analysis, class characteristics, questioned document, forensic science, individual characteristics.



## LATERAL PALM PRINT EXAMINATION AS AN AID TO SIGNATURE ANALYSIS

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India

<sup>1</sup>Department of Forensic Science, Government Institute of Forensic Science, Nagpur,  
Maharashtra, India

### Abstract

Signatures are considered as a means of personal verification, which is legally accepted in all transactions with, financial and administrative institutions. Many conventional methods available for signature analysis to identify the author consists of general handwriting examinations involving analysis of individual and class characteristics. However, the flaw lies within the fact that the writing is a complex motor process solely depending on the psychophysical state of the author and thus they cannot be exactly estimated. In some cases, courts may not give great significance to the evidential value of signature examination alone, but when such evidence is accompanied by a palm print study; the evidential value of the evidence is increased drastically. When a person signs a document, the hypothenar region of the palm comes in contact with the document and the particular measurements of the palm print along with the signature can provide a wide range of information such as the approximate age of the writer, whether the signature is done by hand/leg/anything else, whether the person is right-handed or left-handed, and authenticity of the signature. The following information becomes more vital while dealing with the anonymous letters as it narrows down the list of suspects. The present work is the review of the various studies demonstrating the examination of signatures, highlighting the limitations of a report solely based on handwriting examination and thus the analysis of lateral palm prints can provide support to the information provided by the handwriting expert.

**Keywords:** Signatures, Hypothenar region, Left-handed, Anonymous letter, handwriting expert.

## **GRAPHOLOGY: AN IMPORTANT ASPECT OF FORENSIC INVESTIGATIONS**

Dr. Shuchi Srivastava<sup>1</sup>

<sup>1</sup>Assistant Professor, Department of Anthropology, National Post Graduate College  
Email: shuchi.anthro@gmail.com

### **Abstract**

Handwriting is unique for each person, as it is an individual characteristic. Everybody have their own style of writing. Even, handwriting is as unique as a fingerprint. Graphology or handwriting analysis is related with the questioned documents section of forensics which examines the connection between the author and the text. To determine the case of forgery in documents, examination of the writing on the basis of letter form, line form and formatting is always required. In the present study various dimensions of the forensic graphology have been discussed which may be significant for forensic investigations.

**Keywords:** Graphology, Handwriting analysis, Questioned documents, Forensics.





## DATING OF DOCUMENTS: AN OVERVIEW

Pradnya Sulke<sup>1</sup>, Pooja Pardeshi<sup>1</sup>, Rasika Kakad<sup>1</sup>

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### Abstract

Dating of documents refers to the determination of date when the document was produced. Date here is in the form of a time period or time frame which may vary from months to a year or more. Document dating is one of the most challenging area in the field of questioned document examination. The dating of documents can be done by focusing on different aspects of document that is dating through paper, through inks, through sequence of intersecting lines, through handwriting etc. Determination of age of document becomes of prime importance in the cases involving the document having historical value, or the document in question bearing a date on it which itself is disputed. This article furnishes a broad review of all the techniques of dating documents based on the three approaches along with their possible applications and limitations.

**Keywords:** Questioned document, disputed document, dating technique, age, paper, ink.

## **DIGITAL FORGERY AND ITS FORENSIC EXAMINATION**

Pooja Pardeshi<sup>1</sup>, Pradnya Sulke<sup>1</sup>, Rasika Kakad<sup>1</sup>

<sup>1</sup>M.Sc. Forensic Science I Year (Batch 2020-22) Government Institute of Forensic Science,  
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### **Abstract**

Now a days, we all are connected to digital world. The recent exponential growth in the use of digital things has been accompanied by a parallel increase in their use in criminal activities. Digital forgery or digital tampering is the process of manipulating documents or image for the intent of financial, social or political gain. Forgery of digital documents for example important government documents like GR, wills, educational certificates, has become easier to perfect. In most cases, forgers apply cut and paste techniques to manipulate figures, letters, or words that consequently alter the meaning of the document. The primary goal of this review is to study and characterize various forms of alterations that are encountered in digital documents.

**Keywords:** Digital documents; Forgery; Digital tampering; Forensic Examination; Digital Manipulation.

## VARIATIONS IN HANDWRITING CHARACTERISTICS DUE TO DIFFERENT GRIP PATTERNS

Puravi Tripathi<sup>1</sup>, Saumya Solanki<sup>2</sup>

<sup>1</sup>M.Sc. Forensic Science, SHUATS, LLB.

<sup>2</sup>M.Sc. Forensic Science, BU

### Abstract

The identification of the writer group attributes like gender, age and handedness from handwriting is an important goal in forensic field. In most criminal cases where handwriting is used as evidence where few handwritten characters extracted from tax form, ransom letters, anonymous letters, wills etc. are the disposal of the forensic document examiner. The analysis of handwritten documents from the view point of determining the writer has great bearing on the criminal justice system. A writer's identity cannot be established through a single individual or general feature in the writing. Rather, identification is established through a combination of the significant features of writers. In order to analyse and identify the handwritten document "grip" can also play an important role which give a particular type of handwriting with different handwriting characteristics. This can help a document expert to eliminate a suspect or group of suspects on the basis of their grip pattern.

**Keywords:** Anonymous, Ransom, Grip patterns, General features, Identification, Forensics.



## IMPORTANCE OF BIOMETRICS IN HANDWRITING DETECTION AND DOCUMENTATION

Samarjit Mullick<sup>1</sup>

<sup>1</sup>Guru Nanak Institute of Pharmaceutical Science and Technology

### Abstract

Forensic handwriting comparison, however not restricted to the examination of cursive writing, hand printing, signatures, and numbers, is additionally a vicinity of the broader field of rhetorical document examination. Handwriting Examiners typically possesses to figure out if the signature is real or simulated, dynamic data like speed and pressure square measure elementary and can be estimated qualitatively. The primary premise of handwriting identification is that no a combine of folks write specifically alike, though natural variations occur among the handwriting of each individual. Investigators square measure ready to take into thought degree honest fairly individual factors characteristic of degree individual's handwriting, however as letter construction and proportion, pen movement and position, writing speed, letter and word spacing, therefore the utilization of gildings, punctuation, spelling, and linguistics. It need to be compelled to be noted that handwriting identification or examination is distinct from "handwriting analysis" (graphology) that produces associate attempt to predict character traits from handwriting examination. The latter has still to demonstrate valid and reliable results, whereas analysis has incontestable that virtuoso rhetorical document examiners square measure considerably many ready to accurately compare handwriting samples to figure out authorship, as compared to the mortal. E security question. The answer has been the digital biometric signature: statistics is essentially the science of victimization digital technologies to spot a personality's being supported the individual's distinctive measurable biological characteristic. Applied to handwriting, statistics modification the comparison between digital signatures therefore on avoid falsification and disclaimer. Handwriting analysis involves a combine of phases: 1. the hardware—ink, paper, pens, pencils, typewriter, printers, photocopies, 2. Visual examination of the writing Investigations embody verification; authentication; characterizing papers, pigments, and inks. Handwriting experience found its bases on graphic laws that articulate the principles of the analysis of graphic dynamic. One in all the foremost necessary correlation is that between speed and pressure and their reciprocal compensation. Though the pen pressure results vary from study to review, one consistent finding is that shaping writing (whether text or signatures) will increase the strain on the strategy system and regularly generally mirrored in changes to pen movement speed.

**Keywords:** Handwriting, Punctuations, Biometrics, Pen Pressure, Graphology, Falsification.

## **SIGNATURE DISTORTION IN PHOTOCOPY GENERATION**

Amrita Yadav<sup>1</sup> Afreen Tarannum<sup>2</sup>

<sup>1</sup>M.Sc. Forensic Science, Department of Anthropology

<sup>2</sup>Senior Scientific Officer, SIFS INDIA

### **Abstract**

Analysing original documents is considered more relevant for the signatures and handwritten document examination but the effectiveness decreases significantly however when considering a photocopied version of the original documents. This creates challenges for the forensic experts as various levels of tampering can be performed during the process of photocopying. In the present research works, the author has made an effort to study the effect of photocopying process in five different generations on various line quality features such as the initial and terminal strokes of letters or words, writing instrument features like ink gooping or cluster formation, and numerous other features related with the writer itself like pen lifts, tremors, retracing, merging of strokes, printer effect like widening in line. For the studying this, 2550 genuine signature samples were collected by requesting 25 officers, using different types of pens of different brand on various types of papers, which is commonly used for official purpose. This study has been executed with an aim to help the Forensic Document Examiners in understanding the defects which is frequently seen in the multi-generation copy of signature samples.

**Keywords:** Multi-generation Photocopying, Photocopied Document, Questioned Document, Line Quality.

## HANDWRITING ANALYSIS IN FORENSIC SCIENCE

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### Abstract

Forensic handwriting examination has a new frontier: the digital signature in biometric modality that uses, for recognition purposes, the anatomic and behavioural characteristics that an individual exhibit when signing her/his name. Handwriting analysis is a standard forensics practice to assess the identity of a person from written documents. Forensic document examiners consider different features related to the motion and pressure of the hand, as well as the shape of the different characters and the spatial relationship among them. While examiners rely on standard protocols, documents are generally processed manually. This requires a significant amount of time and may lead to a subjective analysis which is difficult to replicate. Automated forensics tools to perform handwriting analysis from scanned documents are desirable to help examiners extract information in a more objective and replicable way. "Namirial " is an Italian company that created a biometric signature system named "GrafoCerta" (sure signature) that has a forensic sector particularly suitable for research. A team of experts – computer engineers and handwriting experts-collaborate in the project and created a research laboratory on handwriting. Handwriting analysis is an important subject for crime investigation. Handwriting analysis could be described as a combination of intellectual and criminal fraudulence. Handwriting analysis paves the way for justice, with the help of technology advances and recording of visuals are used as evidences. Every new technology like digital forensics have being adopted and used by forensic researchers. Handwriting Examiners often has to determine if the signature is genuine or simulated, dynamic information such as velocity and pressure are fundamental and can be estimated qualitatively. In recent years a technological revolution has affected the world of writing. During the last years, many publications concerning the forensic analysis of questioned documents have been published, and new techniques and methodologies are nowadays employed to overcome forensic caseworks. This article reviews a comprehensive collection of the works focused on this issue, including dating studies, the analysis of inks from pens and printers, the analysis of paper, the analysis of other samples related to questioned documents and studies on intersecting lines. These sections highlight the most relevant analytical studies by a wide range of analytical techniques. Separation and spectrometric techniques are critically discussed and compared, emphasizing the advantages and disadvantages of each one. Finally, concluding remarks on the research published are included. Questioned Document, Handwriting Examination, Fingerprint Comparison, Signature Verification to increase speed of delivery of justice and speedy justice.

**Keywords:** Biometric modality, Automated forensics, Namirial, Handwriting examiners, Signature verification.

## EPOSTER CATEGORY

### RECENT ADVANCEMENT IN QUESTIONED DOCUMENT EXAMINATION – 3D IMAGING IN VSC 8000 AND ECCO-DE LASER INDUCED BREAKDOWN SYSTEM

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#### Abstract

In the digital age new forms of crimes are coming up day by day. There are many complications the cases we face as an investigator as every case has its own story. As we are developing in the sector of technologies even the criminals are getting up to the same as us as investigators use so in order to cope up with the situation, we have to come up with the new advancements in the field in order to the tackle the situations. In the case of the questioned documents, we have many cases like counterfeit currency, forgery, and many more. So, we have some new technologies and the features added to the recent most advanced instruments used by the experts. Out of which most recent ones are feature like 3d imaging in VSC 8000 and technologies like ECCO-DE laser induced breakdown system for the examination of the pencil lead. LIBS works in the case of pencil lead examination because there is elemental difference between the brands of lead pencil so here laser induced breakdown system is much helpful. The 3D imaging feature in the VSC 8000 gives us 3D view of the data written on the surfaces which give a proper analysis which is much more accurate rather than old school Methods of using microscopic examination. Today traditional instruments are improvising with technology and new instruments progress the science of forensic document examination in modern world. This paper highlights traditional methods challenges in forensic document examination and discussed the most recent technologies.

**Keywords:** Questioned documents, Modern instruments, VSC 8000, 3D imaging, ECCO-DE LIBS, Forensic Science



## FORENSIC STYLISTICS

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### Abstract

Stylistics is the study of individual or group of characteristics in written language. It is the method of identification that matches one piece of writing to another by analysing factors such as spelling, text arrangement, abbreviations, word formation, characteristic words and phrases, and syntax. "Forensic stylistics, also known as stylometry is used to examine writing style for the express purpose of resolving litigated questions related to disputed authorship." In criminal cases it is important to study the written and spoken language, so that it can provide information such as offender's age, gender, level of education, race, religious or spiritual beliefs, geographic and socioeconomic background, culture, and ethnicity. It can be applied in cases involving assessment of threat, statement and confession analysis, confirmation of authorship, and false allegations, suicidal notes and cybercrimes. The evidences found can be indirect, demonstrative, substantial, cumulative, positive, negative, or depending on the nature of a particular case, it may provide evidence of rebuttal, impeachment, or corroborative value. There are some principles used to determine the individuality of the stylistics feature. Stylistics have been used in variety of legal cases, especially where documents differ from normal language. There are case studies which have used forensic stylistics as a potential tool to solve various types of legal cases.

**Keywords:** Forensic, Stylistics, Language, Writing, Style

## CHALLENGES FACED DURING EXAMINATION OF SCANNED DOCUMENTS: BASED ON REAL CASE WORKS

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### Abstract

In the modern era, where the forgery of documents is commonly used by people at every stage of their life so it becomes a necessity to examine these forged documents. But due to the current scenario and busy lifestyle of people, it becomes a little difficult to share the hard copy of the documents for the examination, this is where the scanned documents comes in use. Also, original copy of the documents are submitted in the court and are unavailable for the examination, at that time the investigator receive the scanned documents for the examination. Although it is easy to get these documents for the purpose of examination but the examiner also faces a lot of challenges during its investigation. This paper deals with the various challenges or difficulties that an examiner faces during investigation of scanned documents. The case studies used for the paper are real case works which were presented for detailed examination in the area of signature, handwriting, cheque forgery etc.

**Keywords:** Forgery, Scanned Documents, Challenges, Real Cases, Handwriting, Signature

## VIBRATIONAL SPECTROSCOPIC ANALYSIS OF INK FOR FORENSIC EXAMINATION OF QUESTIONED DOCUMENTS: THE EMERGENCE AND UPCOMING ISSUES

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### Abstract

The methods for detection of forgery and alteration of documents are becoming more challenging and sophisticated day by day. Forensic examinations of such questioned documents include physical and chemical analysis of inks. Vibrational spectroscopy namely ATR-FTIR spectroscopy and Raman spectroscopy are two of recently emerging techniques for non-destructive analysis of ink as they provide the relevant chemical information about the ink composition with a user-friendly analytical protocol. However, ATR-FTIR spectroscopy have some limitations as the strong absorption bands of the paper merges and overlaps with the ink signals. Instead of ATR-FTIR spectroscopic techniques, Raman Spectroscopy including resonance Raman Spectroscopy (RRS) and surface-enhanced resonance Raman Spectroscopy (SERRS) has gained interest for ink analysis as it provides about the chemical composition of the ink with very little or no contribution from the paper. In this study, we aim to demonstrate the potential of vibrational spectroscopic techniques by providing an overview of their application to forensic examinations of various types of inks. Additionally, RRS and SERRS is also capable of addressing the chemistry of ink-paper interactions.

**Keywords:** Ink analysis; Questioned document; Forensic Science; Vibrational spectroscopy; Non-destructive analysis

## LASER-INDUCED BREAKDOWN SPECTROSCOPY IN DOCUMENT EXAMINATION - NARRATIVE REVIEW

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### Abstract

Document examination is a branch of forensic sciences which done using various techniques such as Laser-Induced breakdown spectroscopy (LIBS), gas chromatography, coupled mass spectrometry, Raman spectroscopy etc. Laser-induced breakdown spectroscopy (LIBS) is a method which utilizes high energy pulses to promote the optical sample excitation. The LIBS helps in real-time analysis of various inks and questioned documents. Thus the aim of the review was to analyses the LIBS and its application in determination of various inks and origin of documents. We conducted a narrative review. The database used for literature searches was PubMed ranging from 2010-2020. The Medical Subject Headings (MeSH) used for search include 'document investigation' 'LIBS' 'Laser- Induced breakdown spectroscopy' 'Forensic'. After exclusion of irrelevant records 4 full text articles were selected for the study. The findings of the review suggests that Laser-induced breakdown spectroscopy (LIBS) used to determine the ink type used in handwritten documents and the typewritten documents with the depth of typing, spacing and fonts which helps to determine the origin of various documents and even the latent fingerprints detected with LIBS. The results suggests that LIBS is a perfect tool to determine the origin of documents and used to improve the forensic comparisons of gel inks, ballpoint inks and document papers based on similarities in elemental composition.

**Keywords:** Forensic, Document investigation, LIBS, Laser-induced breakdown spectroscopy



## APPLICATION OF IMAGE PROCESSING TECHNIQUES IN EXAMINATION OF SCANNED DOCUMENTS

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### Abstract:

Forensic examination of questioned documents is one of the major tasks performed by the forensic investigator. In the current scenario, document plays a vital role in routine life. However, digital technology enabled use of document in digital. It involved the creation or generation of documents, its transmission through electronic channel and storage as well. Digitization of document is another significant factor trending nowadays. Amid this heavy use of document in digital form, the probability of misuse of the technology to create a drill of fake document cannot be underestimated. Forensic Examination of the scanned documents has remained subject of interest for the forensic echelon. Examination of scanned documents is a cumbersome task that requires professional experience. The scanner may not be able to record all the fine details of the document. Image processing software may provide an additional aid in order to detect the forgery or any kind of manipulation. While, assessing the authorship of the document, scanned documents must contain significant number of writing details. The adequate exploration of the emerging image processing technology, may significantly contribute towards the examination of scanned documents.

**Keywords:** Forensics, Questioned Document, Scanned Document, Forgery, Image Processing

## COMPARATIVE STUDY ON CURRENCY BEFORE AND AFTER DEMONETIZATION: A REVIEW

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### Abstract

The process of withdrawal of a specific type of currency from circulation is known as demonetization. As the national currency changes, demonetization becomes inevitable. The old currency unit must be recovered and replaced with a new currency unit. It entails either adding new notes or coins of the same denomination or fully replacing the old denominations with the new denomination, which is typically done as a black market ambush. Banknote counterfeiting is a big concern. Every country provides different types of security features in their banknotes to avoid counterfeiting. These security features make banknotes less susceptible to forgery. These are the unique features that were applied to a banknote either at the time of manufacture or in the middle of the manufacturing process. Paper quality, intaglio printing, watermarks, protection threads, latent picture, and other special features are examples of these. This review paper deals with the comparative study of security features of Indian currency notes before and after demonetization.

**Keywords:** Demonetization, Currency, banknotes, Counterfeit, Ambush, Intaglio Printing.

## INDIVIDUALIZATION THROUGH STYLISTICS FEATURES IN TYPEWRITTEN DOCUMENTS

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### Abstract

Nowadays typing is becoming the most preferred way of writing due to an over sought global demand of digitalization as well as part of environmental activism. However when a Forensic Document Examiners (FDE's) come across such type of documents, then the traditional method of document examination fails. When the authorship of a typewritten document is questioned, then it is important to understand the writing style and once the Forensic Document Examiners have understood the writing style of the questioned document's author then he/she can extract the stylometry features. Stylometry is basically the study of the linguistic style and writing behaviour of an individual, it helps the Forensic Document Examiners in establishing the authorship of the questioned typewritten document. Here in this paper, a case has been discussed in which the authorship of typewritten documents were questioned. After doing detailed analysis of the provided questioned typewritten documents, stylistic features such as idiosyncrasies, sentence construction, use of phrase, catch words, abbreviations, punctuations etc. were observed in questioned as well as admitted documents. After observing all the features, it was concluded that the habit of the executing paragraphs and language in admitted and questioned typewritten documents was found to be similar.

**Keywords:** - Stylometry, Linguistic Style, Typing Habit, Writing Behaviour, Typewritten Document

## CONVENTIONAL AND NON-CONVENTIONAL METHODS OF DECIPHERING SECRET WRITING

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### Abstract

Secret writing is any means of written communication whereby a spy conceals the actual written text, whether it is enciphered/encoded or not. Techniques of secret writing include the use of invisible ink and carbon copies. Secret writing is a skill of concealed writing. The art of secret writing is projected to make the written text unreadable by another person who is exposed or deciphered by a different revealing process to make the messages readable. Techniques of secret writing include the use of invisible inks, carbon copies, miniature writings, latent photographs, codes, and ciphers. Among these, the use of invisible inks is the most primitive method; others are the result of developments in the field of secret writing with the advancement of time. There are several techniques and processes available for ink forgeries. Some of them are tricky but routinely practiced to commit crimes related to deeds, bills, cheques, will, contracts and certain other financial documents. Invisible ink or magic ink is one of the modern technology widely used for committing financial forgeries. It is of two types, erasable ink, and disappearing ink. Disappearing ink fades away without leaving any trace after few hours upon exposure to CO<sub>2</sub> (any other acid) in the air. Another type of ink is erasable ink which can be easily removed by certain rubbers incorporated in each pen. The current study comprises secret writing samples which contain hidden messages written using some fruit juices (lemon, apple, and grape juice), chemical fluids (detergent, sugar solution, and vinegar), and biological fluids (milk, saliva, and sweat).

**Keywords:** Secret writing, Erasable ink, Disappearing ink, Magic ink, Invisible ink, Deciphered, Forensic science



## CHALLENGES IN FORENSIC EXAMINATION OF PHOTOCOPIED DOCUMENT

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### Abstract

Forensic examination of the photocopied documents is carried out to determine the nature, source and authenticity of the photocopied documents. Examination of photocopied documents considers all possible avenues that are, physical characteristics, defect marks and toner analysis to determine their nature and source. It has become apparent that the criminals/forgers are using more advanced methodology to commit a crime and they are also aware about the possibility of their identification through their handwriting examination and signature verification using various writing instruments on paper. Hence, they use an alternative by opting machine generated forged documents in place of original document i.e. the photocopied document to eliminate the original identifying features of genuine document. Analysis of photocopied document is done in order to ascertain the authorship of handwritten text content as well as signatures, to establish genuineness or non-genuineness, or to reveal the additions, alterations, deletions in cases of forgery. In cases, where the photocopied document is only required to examine, in absence of original document it becomes more challenging to opine based on limited data, Hence, in such problematic circumstances, it is very difficult to fix the authorship of signature or handwriting in absence of original. The handwriting features like pen lift, pen skipping, pen pressure, and the most important thing is that the line quality of the stroke cannot be examined by the photocopied document.

**Keywords:** Forensic examination, Genuineness, Authorship, photocopied documents.



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