Curriculum Vitae

Dr. Rajesh Kumar Verma

Director (Retd), Directorate of Forensic Services, Himachal Pradesh

Date of Birth: 6th Oct. 1965

Email: rkumar.65@gmail.com

Phone: +919418555668, +919882037294

Education

M. Sc, Ph. D (Physics) from Indian Institute of Technology, Roorkee.

Professional Experience

- Director, Directorate of Forensic Services, Junga, Shimla (H.P.)
  March 2023 to Oct 2023.
- Deputy Director, Regional Forensic Science Laboratory, Mandi (H.P.)
  Jan 2011 to March 2023.
- Assistant Director, State Forensic Science Laboratory, Junga, Shimla (H.P.)
  Feb 2000 to Jan 2011.
- Project Associate, State Council for Science, Technology and Environment, Shimla (H.P.)
  Dec 1995 to March 1999

Experience

More than 30 years in research and analytical work out of which more than 23 years in a Forensic Science Laboratory.

- Former Director of the Directorate of Forensic Services, responsible for providing leadership and strategic direction, planning, development, and implementation of forensic techniques and methodologies.
- Former Deputy Director of the Regional Forensic Laboratory, overseeing different divisions in the laboratory, scene of crime visits, research and development initiatives, and administrative matters.
- Former Assistant Director of the Physics and Ballistics Division at the State Forensic Science Laboratory, responsible for scientific examination reports in crime cases, supervision of subordinate Scientific Officers, and teaching and training activities.

Publications

1. A rapid and non-destructive discrimination and source correspondence of tyres by Raman spectroscopy combined with chemometrics, Microchemical Journal, Volume 219, December 2025, 116164, https://doi.org/10.1016/j.microc.2025.116164
2. Chemometric classification and source attribution of the types and brands of cling films using ATR-FTIR; an exploration using PLS-DA, Australian Journal of Forensic Sciences, 1-21, 2025, https://doi.org/10.1080/00450618.2025.2566101
3. A rapid and non-destructive identification of animal hairs using ATR-FTIR and chemometrics: aproof-of-concept for wildlife forensic applications, Problems of Forensic Sciences, 138, 2024, pp. 137 – 152, https://doi.org/10.4467/12307483PFS.24.009.20182
4. Rapid and nondestructive analysis of lipstick on different substrates using ATR-FTIR spectroscopy and chemometrics, Journal of Forensic Sciences, Volume 68, Issue 3, May 2023, Pages 1001-1008, https://doi.org/10.1111/1556-4029.15223.
5. Forensic analysis of nail polish traces on different substrates using ATR-FTIR spectroscopy and chemometric methods, Forensic Chemistry, Volume 34, July 2023, 100503. https://doi.org/10.1016/j.forc.2023.100503.
6. Discrimination and source correspondence of black gel inks using Raman spectroscopy and chemometric analysis with UMAP and PLS-DA, Chemometrics and intelligent laboratory systems,Volume 225, 15 June 2022, 104557, https://doi.org/10.1016/j.chemolab.2022.104557.
7. Raman Spectroscopy with Self-Organising Feature Maps and Partial Least Squares Discriminant Analysis for Discrimination and Source Correspondence of Red Gel Ink Pens, Microchemical Journal,Volume 175, April 2022, 107170,https://doi.org/10.1016/j.microc.2021.107170.
8. Towards facial recognition using likelihood ratio approach to facial landmark indices from images, Forensic Science International; Reports, Volume 5, July 2022, 100254, https://doi.org/10.1016/j.fsir.2021.100254.
9. On the discrimination between facial creams of different brands using Raman spectroscopy and partial least squares discriminant analysis for forensic application, Science and Justice, Volume 61, Issue 6, November 2021, Pages 687-696, https://doi.org/10.1016/j.scijus.2021.08.006.

10. Novel use of Logistic regression and likelihood ratios for the estimation of gender of the writer from a database of handwriting features, Australian Journal of Forensic Sciences, Volume 55, 2023, Issue 1, https://doi.org/10.1080/00450618.2021.1956587.
11. Rapid non-destructive techniques to identify the traces of Kajal using chemometrics; A comparison of ATR-FTIR and Raman spectroscopy, MNM Asri, R Verma, MH Ibrahim, V Sharma, NAM Nor - Microchemical Journal, Vol 169, 2021. https://doi.org/10.1016/j.microc.2021.106556
12. A rapid and non-destructive ATR-FTIR spectroscopy method supported by chemometrics for discriminating between facial creams and the classification into herbal and non-herbal brands, A Sharma, R Chauhan, R Kumar, P Mankotia, R Verma, V Sharma, - SpectrochimicaActa Part A: Molecular and Biomolecular Spectroscopy, Vol 258, 2021. https://doi.org/10.1016/j.saa.2021.119803
13. On the discrimination of inkjet, laser and photocopier printed documents using Raman spectroscopy and chemometrics: Application in forensic science, MNM Asri, NF Nestrgan, NAM Nor, R Verma - Microchemical Journal, Vol 165, 2021. https://doi.org/10.1016/j.microc.2021.106136
14. Chemometrics based ATR-FTIR spectroscopy method for rapid and non-destructive discrimination between eyeliner and mascara traces,T Arora, R Verma, R Kumar, R Chauhan, B Kumar, V Sharma- Microchemical Journal, Vol 164, 2021. https://doi.org/10.1016/j.microc.2021.106080
15. Chemometric analysis of ATR-FTIR spectra of fingernail clippings for classification and prediction of sex in forensic context- A Sharma, R Verma, R Kumar, R Chauhan, V Sharma - Microchemical Journal, vol 159, 2020. https://doi.org/10.1016/j.microc.2020.105504
16. Estimation of sex in forensic examinations using logistic regression and likelihood ratios, R Verma, K Krishan, D Rani, A Kumar, V Sharma - Forensic Science International: Reports, Vol 2, 2020. https://doi.org/10.1016/j.fsir.2020.100118
17. Detecting Deepfakes with Metric Learning, 8th International Workshop on Biometrics and Forensics, IWBF 2020 – Proceedings, https://doi.org/10.1109/iwbf49977.2020.9107962.

18. Syn2Real: Forgery Classification via Unsupervised Domain Adaptation, 2020 IEEE Winter Conference on Applications of Computer Vision Workshops, WACVW 2020, https://doi.org/10.1109/wacvw50321.2020.9096921.
19. No Reference Evaluation in Super-Resolution for CCTV Footage, 13th International Conference on Industrial and Information Systems, ICIIS 2018 – Proceedings, https://doi.org/10.1109/iciinfs.2018.8721319.
20. Stature estimation in forensic examinations using regression analysis: A likelihood ratio perspective, R Verma, K Krishan, D Rani, A Kumar, V Sharma - Forensic Science International: Reports, Vol 2, 2020. https://doi.org/10.1016/j.fsir.2020.100069
21. Identification of Tool Marks of a Sickle on a Telephone Cable- Rajesh Kumar, N S Patial, Sanjeev Singh, J Forensic Sci, January 2013, Vol. 58, No.1. https://doi.org/10.1111/j.1556-4029.2012.02276.x
22. Evaluation of Two Instrumental Methods of Comparing Writing Paper, R Kumar, -J Forensic Sci, Vol. 56, No. 2, March 2011. https://doi.org/10.1111/j.1556-4029.2010.01661.x
23. Application of simple Bayesian statistics to a sample database for source correspondence, R Kumar, -Forensic Science International, 195, 128–131, Feb 2010. https://doi.org/10.1016/j.forsciint.2009.12.004
24. Evaluation of Instrumental Methods of forensic fabric Comparison"- Rajesh Kumar, N S Patial, The Indian Police Journal, Vol LIII No.4, Oct-Dec 2006.
25. Improving the Crime Investigation Process; Forensic Scientist's Perspective", Rajesh Kumar, Indian Police Journal, Sept 2003.
26. Density Determination of glass fragments using top loading balances", Rajesh Kumar, CBI Digest, 2002.
27. The Lienard-Wiechert potentials applied to close electric fields due to lightning return stroke above a finitely conducting ground, R Kumar, J Rai, V Singh, Ind J. of Radio and Space Physics, 29, 309, 2000.
28. Lightning Return Stroke Fields above ground, R Kumar, J Rai, V Singh, J. Atmos. &Terres. Phys., 57, No. 11, 1995. https://doi.org/10.1016/0021-9169(95)00012-Q
29. Effect of reaction N + NO => N*2 (v=5) + O on the production of NO by lightning, R Kumar, V Singh, J Rai, - J. Atmos. Sci., 51/2, 1994.

https://doi.org/10.1175/1520-0469(1994)051%3C0323:EOTRNN%3E2.0.CO;2

30. High Speed Photographic analysis of lightning radiation fields" – Ann. Geophysicae, 11, 1993.
31. Close Electric Fields due to lightning above a finitely conducting ground, R Kumar, J Rai, V Singh, Ind J. Radio & Space Physics, 21, 1992.

Papers in Conferences

1. N. Bhardwaj, R. Verma, A. Bhavsar. “Application and validation of likelihood ratio approach in forensic facial recognition using morphometric indices.” IASR 6th International eConference on Cyber & Digital Forensics, 2021.**(Best paper award)**
2. N. Bhardwaj, R. Verma, A. Bhavsar. "Validation and Confidence Interval Estimation for the Determination of Height of Person from CCTV Footage using Reverse Projection Photogrammetry." IASR 1st International e-Conference on Emerging Trends in Forensic Science, 2021.**(Best paper award)**
3. N. Bhardwaj, R. Verma, A. Bhavsar, P. Rajan. "Preliminary Study on the Person Identification from Face Morphometrics using Likelihood Ratio". International Conference on Police Science, Futuristic Security and Policing Architecture, ICPS-2019.**(Best paper award)**
4. N. Bhardwaj, R. Verma, P. Rajan, A. Bhavsar. "Study of the Variability of Male Voices using Likelihood Ratio Approach". International conference on Forensic Research and Analysis, 2019. **(Best paper award)**
5. N. Bhardwaj, R. Verma, P. Rajan, A. Bhavsar. "Voice Comparison in the Likelihood Ratio Framework: A Preliminary Study". National Conference on Challenges and Innovations in Criminal Justice System, FORENSICON-2019.
6. A. Kumar, A. Bhavsar, R. Verma. "Detecting Deepfakes with Metric Learning."International Workshop on Biometrics and Forensics (IWBF) 2020.
7. A. Kumar, A. Bhavsar, R. Verma. "Syn2Real: Forgery Classification via Unsupervised Domain Adaptation." Winter Conference on Application of Computer Vision (WACV), DeepPAB Workshop 2020.

8. A. Chawdhary, S. Kumari, A. Bhavsar, R. Verma. "No reference evaluation in super-Resolution for CCTV footage." International Conference on Industrial and Information Systems (ICIIS 2018), 2018.
9. R. Verma, Confidence and prediction interval approach to estimate stature using regression analysis, National Conference on "Recent Advancements in Forensic Science" organized by Department of Forensic Science, JAIN (Deemed-to-be-University) on 26th and 27th July 2019.
10. R. Verma, Estimation of stature from humerus bone length and foot length using open source statistical software R, International Conference on Recent trends in basic and applied science" at MAU, Baddi, 26-27 March 2016.
11. R. Verma, Investigation of structure failure of a foundation stone memorial, International Conference on Emerging Trends in Basic and Applied Sciences, MAU Baddi, May 1-2, 2015.

Professional Trainings Undergone

(1.) Online course on **Crime Scene Management including CCTV Analysis** from 31.08.2020 to 04.09.2020 conducted by NICFS, New Delhi.

(2.) Online course on **Speaker Identification and Tape Authentication** from 07.09.2020 to 09.09.2020 conducted by NICFS, New Delhi.

(3.) Online course on **Information Security, Digital Forensics and Online Social Media f**rom 02.11.2020 to 06.11.2020 conducted by NICFS, New Delhi.

(4.) Online course on **Forensic Report Writing Statistics and Standards** from 02.12.2020 to 04.12.2020 conducted by NICFS, New Delhi

(5.) Online course on **Imaging and Video Technology** from 28.12.2020 to 30.12.2020 conducted by NICFS, New Delhi

(6.) "**Certificate Course on Digital Forensics Including Open Source Tools**" organized by LNJN National Institute of Criminology and Forensic Science, New Delhi, Aug 2-15, 2015.

(7.) Training Programme on "**Knowledge Management**" organized by Institute of Secretariat Training and Management (ISTM) , New Delhi during Aug 26-28, 2012.

(8.) Workshop on "**Technical and Legal Issues in connection with Polygraph, Narco-Analysis and Brain Mapping"** at National Institute of Criminology and Forensic Science, Delhi during Dec 26-28, 2006.

(9.) Training Programme on "**Office Procedures and financial Administration"** conducted by Himachal Pradesh Institute of Public Administration, Shimla during Nov 27-Dec1, 2006.

(10.) Training Programme in "**Statistics and Use of Data in Government**", conducted by Himachal Pradesh Institute of Public Administration, Shimla during Dec 12-14, 2005.

(11.) Workshop on **"Instrumental methods of Analysis**", conducted by NICFS, Delhi during Nov 22-25, 2004.

(12.) Course on **"Windows 98 and MS Office 2000**", conducted by Himachal Pradesh Institute of Public Administration during Feb 3-7, 2003.

(13.) Practical training in "**Forensic Physics and Ballistics"** at Punjab State forensic Science Laboratory, Chandigarh, during June 17-28, 2002.

(14.) Foundation Course in "**Forensic Science"** conducted by NICFS, Delhi during April 16-July 10, 2001.

(15.) In Service training course in "**Forensic Analysis of Firearm Injuries**" at CFSL Chandigarh during Jan 22-25, 2001.

(16.) Practical training in "**Forensic Physics and Ballistics"** at Punjab State Forensic Science Laboratory, Chandigarh, during July 17-27, 2000.

Grants and Fundings

1. **Completed**: Development of State of the art digital forensic facilities for Forensic Laboratories in HP under State Innovation Fund of H.P. State Govt. (Rs 16.84 lacs)
2. **Ongoing**: A deep learning and machine learning based package for detecting forgeries in images, video, and audio; sponsored by DFSS, MHA, GOI (Co-investigator)

Professional Skills

Forensic Science, Forensic Physics, Ballistics, Facial Recognition, Voice Comparison, Image and Video Forensics, Statistics and its applications in Forensic Science (forensic data science), Machine Learning, R Statistical and data analysis software.