RUCHIRA NASKAR

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PERSONAL INFORMATION

- Date of Birth: 1st October, 1985
- Permanent Address: 67/4 Lake East 6th Road, Kolkata, W.B., India 700075

RESEARCH INTERESTS

- Multimedia Security
- Digital Forensics
- Computer Vision

ACADEMIC BACKGROUND

• Ph.D. in Computer Science and Engineering,

Indian Institute of Technology, Kharagpur, (July 2010 - July 2014)

<u>Ph.D. Thesis Title</u>:"Reversible Watermarking of Digital Images: Algorithms and Implementation" <u>Summary of PhD Research:</u>

In my Ph.D. research I have mainly focused on the theory behind, as well as implementation of reversible watermarking algorithms for digital images. In my Ph.D. thesis, specifically the following problems have been addressed:

(1) Investigating the performance of state-of-the-art reversible watermarking algorithms under specific circumstances, such as an extremely noisy environment, where the cover data is highly vulnerable to get tampered.

(2) Investigating the applicability of state-of-the-art reversible watermarking algorithms to areas other than grayscale imagery, such as color imagery, halftone imagery as well as other forms of multimedia, such as audio files.

(3) Developing a mechanism to localize tampering in reversibly watermarked multimedia data, to reduce false rejection rate when authentication fails at the receiver side.

(4) Reducing runtime requirements of existing reversible watermarking algorithms, which often require very large complex operations to execute.

(5) Finally, developing a theoretical evaluation platform for analyzing and evaluating the reversible watermarking algorithms.

- M.Tech in Information Technology Indian Institute of Technology, Kharagpur, (2008 – 2010) CGPA: 9.40 / 10.00 <u>M.Tech. Thesis Title:</u> "Hierarchical Secret Sharing and Proactive Renewal of Shares"
- B.Tech in Information Technology West Bengal University of Technology, (2004 – 2008) CGPA: 8.34 / 10.00

ACADEMIC POSITION HELD

- Associate Professor, Indian Institute of Engineering Science and Technology, Shibpur (August 2023 till date)
- Assistant Professor, Indian Institute of Engineering Science and Technology, Shibpur (May 2019 August, 2023)
- Assistant Professor, National Institute of Technology, Rourkela (February 2014 May 2019)

RESEARCH PUBLICATIONS

<u>Patent</u>

1. R. S. Chakraborty, **R. Naskar** and B. Sarkar, "A Method and System for Evaluation of Reversible Watermarking of Digital Images and Audio", Indian Patent No.: 405072, Application No.: 0653/KOL/2013, filed on May 31, 2013, granted in August 2022.

<u>Copyright</u>

- 1. R. Naskar, D. Das and R. Das, "A Forensic System for Feature based Image Splicing Detection and Evaluation", Indian Copyright Diary No.: 22698/2023-CO/SW, Registration No. SW-17587/2023, filed in August 2023, granted in December 2023.
- 2. **R. Naskar**, V. U. Sameer, R. S. K. Reddy and S. G. Chandra, "A System for Execution and Evaluation of Forensic Source Identification of Digital Images", Indian copyright registered in April 2018 (Registration No.: SW-10532/2018 Dated: 25/04/2018, Diary No.: 16791/2017-CO/SW Dated: 29/11/2017).

<u>Books</u>

- 1. **R. Naskar**, V. U. Sameer, R. Dixit and J. Bakas, "Digital Forensics: Current Trends and Practices", Studium Press (India), ISBN 13: 978-93-85046-48-3, 2019.
- A. Roy, R. Dixit, R. Naskar and R. S. Chakraborty, "Digital Image Forensics Theory and Implementation", Springer, Print ISBN: 978-981-10-7643-5, Online ISBN: 978-981-10-7644-2, 2019.
- 3. **R. Naskar** and R. S. Chakraborty, "Reversible Digital Watermarking: Theory and Practices", Morgan and Claypool Publishers, USA, ISBN: 978-1-627-05315-0, 2014.
- 4. **R. Naskar**, "Secret Sharing in User Hierarchy: Share Generation, Distribution and Renewal", Lambert Academic Publishing (LAP), GmbH & Co. KG, Germany, ISBN: 978-3-659-34264-6, 2013.

Book Chapters

- J. Bakas and R. Naskar, "Detection and Localization of Double Compressed Forged Regions in JPEG Images using DCT Coefficients and Deep Learning based CNN", in Dr. S. Roy, Dr. R. S. Chakraborty, Dr. J. Mathew, Dr. A. P. Mazumdar, Dr. S. Chakraborty (Ed.), "Artificial Intelligence and Deep Learning for Computer Network", CRC Press (ISBN 9781032079592 print, ISBN 9781003212249 e-book), 2023.
- S. Chinara, R. Naskar, J. Bakas, S. N. Mishra, "Illegitimate EPR Modification: A major threat in IoT based healthcare system and its remedy through blind forensic measures, in Dr. S. Pal, Dr. V. Diaz, Dr. D-N Le (Ed.), "IoT: Security and Privacy Paradigm (Chapter-12, pp. 257)", CRC Press, Taylor and Francis Group, 2020.
- 3. **R. Naskar**, P. Malviya and R. S. Chakraborty, "Digital Forensics: State-of-the-Art and Open Problems", in Dr. R. Pal (ed.), "Innovative Research in Attention modeling for Computer Vision Applications", IGI Global, 2015 (ISBN: 9781466687233 print, ISBN: 9781466687240 e-book).
- 4. **R. Naskar** and R. S. Chakraborty, "Reversible Watermarking: Theory and Practice", in Dr. B. Issac (ed.), "Case Studies in Secure Computing Achievements and Trends", CRC Press, 2014.
- 5. **R. Naskar**, R. S. Chakraborty, D. K. Das and C. Chakraborty, "Digital Image Watermarking: Impact on Medical Imaging Applications in Telemedicine", in Dr. R. Srivastava (ed.), "Recent Advances in Computer Vision and Image Processing: Methodologies and Applications", IGI Global, 2013.

<u>Journals</u>

- 1. A. Dutta, S. P. Nayak, **R. Naskar** and R. S. Chakraborty, "KOL-4-GEN: Stacked Kolmogorov-Arnold and Generative Adversarial Networks for Malware Binary Classification through Visual Analysis", IEEE Embedded Systems Letters, 2024. (Q2) (Accepted)
- 2. R. Chakraborty and **R. Naskar**, "Role of Human Physiology and Facial Biomechanics Towards Building Robust Deepfake Detectors: A Comprehensive Survey and Analysis", Computer Science Review, Elsevier, 54, 100677, 2024.
- 3. D. Das and **R. Naskar**, "Image Splicing Detection using Low-Dimensional Feature Vector of Texture Features and Haralick Features Based on Gray Level Co-Occurrence Matrix", Signal Processing: Image Communication, Elsevier, 125, 117134, 2024.
- 4. A. Bhowal, S. Neogy and **R. Naskar**, "Deep Learning based Forgery Detection and Localization for Compressed Images Using A Hybrid Optimization Model", Multimedia Systems, Springer, vol. 30, no. 3, pp. 128, 2024.
- 5. T. Ghosh and **R. Naskar**, "Less is More: A Minimalist Approach to Robust GAN-Generated Face Detection", Pattern Recognition Letters, Elsevier, vol. 179, pp. 185-191, ISSN 0167-8655, 2024.
- 6. A. K. Das and **R. Naskar**, "A Deep Learning Model for Depression Detection based on MFCC and CNN Generated Spectrogram Features", Biomedical Signal Processing and Control, Elsevier, vol. 90, April 2024, 105898, ISSN 1746-8094, 2024.
- 7. D. Das, **R. Naskar** and R.S. Chakraborty, "Image Splicing Detection with Principal Component Analysis Generated Low-dimensional Homogeneous Feature Set based on

Local Binary Pattern and Support Vector Machine", Multimedia Tools and Applications, Springer, vol. 82, July 2023, pp. 25847–25864, 2023.

- 8. A. Panda, **R. Naska**r and S. Pal, "Generative Adversarial Networks for Noise removal in Plain Carbon Steel Microstructure images", IEEE Sensors Letters, vol. 6, no. 3, pp. 1–4, 2022.
- 9. J. Bakas, **R. Naskar**, M. Nappi and S. Bakshi, "Object based Forgery Detection in Surveillance Video using Capsule Network", Journal of Ambient Intelligence and Humanized Computing, Springer, vol. 89, 106929, 2021.
- 10. S. Nath and **R. Naskar**, "Automated Image Splicing Detection using Deep CNN Learned Features and ANN based Classifier", Signal, Image and Video Processing, Springer, vol. 15, pp. 1601–1608, 2021
- 11. J. Bakas, **R. Naskar** and S. Bakshi, "Detection and localization of inter-frame forgeries in videos based on macroblock variation and motion vector analysis", Computers and Electrical Engineering, Elsevier, vol. 89, 106929, 2021.
- V. U. Sameer and R. Naskar, "Deep Siamese Network for Limited Labels Classification in Source Camera Identification", Multimedia Tools and Applications, Springer, vol. 79, no. 37, pp. 28079-28104, 2020.
- 13. J. Bakas, S. Ramachandra and **R. Naskar**, "Double and triple compression based forgery detection in JPEG images using deep convolutional neural network", SPIE Journal of Electronic Imaging, vol. 29, no. 2, 23006, 2020.
- 14. D. B. Tariang, R. S. Chakraborty and **R. Naskar**, "A Robust Residual Dense Neural Network for Countering Anti-Forensic Attack on Median Filtered Images", IEEE Signal Processing Letters, vol 26, no. 8, pp. 1132-1136, 2019.
- 15. A. Panda, **R. Naskar** and S. Pal, "A Deep Learning Approach for Segmentation of Plain Carbon Steel Microstructure Images", IET Image Processing, vol. 13, no. 9, pp. 1516-1524, 2019.
- 16. A. Choudhury, S. Pal, **R. Naskar** and A. Basu, "Computer Vision Approach for Phase Identification from Steel Microstructure", Engineering Computations, 2019. (Accepted)
- 17. R. Dixit and **R. Naskar**, "Region Duplication Detection in Digital Images based on Centroid Linkage Clustering of Key-points and Graph Similarity Matching", Multimedia Tools and Applications, Springer, 2018, pp. 1-22, doi: 10.1007/s11042-018-6666-1.
- 18. A. Panda, **R. Naskar** and S. Pal, "Exponential linear unit dilated residual network for digital image denoising", SPIE Journal of Electronic Imaging, vol. 27 no. 5, 053024, 2018. doi: 10.1117/1.JEI.27.5.053024.
- 19. J. Bakas, **R. Naskar** and R. Dixit, "Detection and localization of inter-frame video forgeries based on inconsistency in correlation distribution between Haralick coded frames", Multimedia Tools and Applications, Springer. doi: 10.1007/s11042-018-6570-8 (Accepted in August 2018).
- 20. V. U. Sameer and **R. Naskar**, "K-Unknown Models Detection through Clustering in Blind Source Camera Identification", IET Image Processing, vol. 12, no. 7, pp. 1204–1213, 2018.
- 21. R. Dixit and **R. Naskar**, "Copy-Move Forgery Detection utilizing FMT-Log Polar Features", SPIE Journal of Electronic Imaging, vol. 27, no. 2, 023007, 2018. doi: 10.1117/1.JEI.27.2.023007.
- 22. V. U. Sameer and **R. Naskar**, "Eliminating the Effects of Illumination Condition in Feature based Camera Model Identification", Journal of Visual Communication and Image Representation, Elsevier, vol. 52, no. 2, pp. 24-32, 2018.
- 23. V. U. Sameer and **R. Naskar**, "Blind Image Source Device Identification Practicality and Challenges", International Journal of Information Security and Privacy, IGI Global, vol. 12, no. 3, article 5, 2018.
- 24. S. Gupta, A. Panda, **R. Naskar**, D. Mishra and S. Pal, "Processing and refinement of steel microstructure images for assisting in computerized heat treatment of plain carbon steel", SPIE Journal of Electronic Imaging, vol. 26, no. 6: 063010, 2017.
- 25. R. Dixit and **R. Naskar**, "Review, Analysis and Parameterization of Techniques for Copy-Move Forgery Detection in Digital Images", IET Image Processing, vol. 11, no. 9, pp. 746-759, 2017.
- 26. R. Dixit, **R. Naskar** and S. Mishra, "A blur-invariant copy-move forgery detection technique with improved detection accuracy utilizing SWT-SVD", IET Image Processing, vol. 11, no. 5, pp. 301-309, 2017.
- 27. **R. Naskar** and R. S. Chakraborty, "A Technique to Evaluate Upper Bounds on Performance of Pixel-Prediction based Reversible Watermarking Algorithms", Journal of Signal Processing Systems (Springer), vol. 79, no. 3, pp. 1-17, Jun. 2015.
- 28. **R. Naskar** and R. S. Chakraborty, "A Generalized Tamper Localization Approach for Reversible Watermarking Algorithms", ACM Transactions on Multimedia Computing Communications and Applications, vol. 9, no. 3, article 19, Jun. 2013.
- 29. **R. Naskar** and R. S. Chakraborty, "Histogram-Bin-Shifting based Reversible Watermarking for Color Images", IET Image Processing, vol. 7, no. 2, pp. 99-110, Mar. 2013.

- 30. **R. Naskar** and R. S. Chakraborty, "Performance of Reversible Digital Image Watermarking under Error-prone Data Communication: a Simulation-based Study", IET Image Processing, vol. 6, no. 6, pp. 728-737, Aug. 2012.
- 31. **R. Naskar** and R. S. Chakraborty, "Reversible Watermarking Utilizing Weighted-median based Prediction", IET Image Processing, vol. 6, no. 5, pp. 507-520, Jul. 2012.
- 32. **R. Naskar** and I. Sengupta, "Secret Sharing and Proactive Renewal of Shares in Hierarchical Groups", International Journal of Computer Science and Information Technology, vol. 2, no. 3, pp. 160-179, Jul. 2010.

Conferences

- 1. S. Modak, A. K. Das and **R. Naskar**, "SpecViT : A Custom Vision-Transformer based Approach for Audio Deepfake Detection", 2025 IEEE International Conference on Acoustics Speech and Signal Processing (ICASSP), Hyderabad, India, 2025. (Accepted)
- 2. T. Ghosh, Jingyasa, T. Saha, and **R. Naskar**, "Identifying Diffusion Model Generated Synthetic Faces Covering OSN Context and Ethnic Diversity", IEEE Indicon, IIT Kharagpur, 2024.
- 3. A. K. Das, K. A. Reddy, H. Bomminayuni, and **R. Naskar**, "A Multimodal End-to-End Speech Emotion Recognition Framework based on Audio Spectrographic and Chroma Features, Fused by Deep Learning SERe_DL Model", IEEE Indicon, IIT Kharagpur, 2024.
- 4. A. Bhowal, S. Neogy, and **R. Naskar**, "A Weighted Ensemble Approach for Improved Image Forgery Detection Using Deep Learning Models", IEEE COMSYS, BITS Pilani, 2024.
- 5. A. Bhowal, R. Naskar and S. Neogy, "CompressionShield: Architectural Adaptations towards Enhancing InceptionV3 for Image Forgery Detection", IEEE CALCON, Jadavpur University, 2024.
- 6. S. Mandal, B. Ghosh, S. Chakraborty and **R. Naskar**, "Can Deepfakes Mimic Human Emotions? A Perspective on Synthesia Videos", TENCON IEEE Region 10 Conference, 2024. (Accepted)
- 7. S. Kundu, T. Ghosh and **R. Naskar**, "Using Local Phase Quantization to Identify Fake Faces in Online Social Networks", TENCON IEEE Region 10 Conference, 2024. (Accepted)
- 8. D. Das and **R. Naskar**, "Splicing Localization in Digital Images through Agglomerative Clustering on Optimized Feature Sets with Zero Training Data Dependency", 27th International Conference on Pattern Recognition (ICPR), 2024. (Accepted)
- 9. T. Ghosh and **R. Naskar**, "POSTER: GAN and DM Generated Synthetic Image Detection in the Age of Misinformation", ACNS 2024: 22nd International Conference on Applied Cryptography and Network Security, Abu Dhabi, UAE, 2024. To be published in the post-proceedings published in LNCS series by Springer. (Accepted)
- 10. D. Das, R. Das and R. Naskar, "Spliced Region Detection and Localization in Digital Images based on CNN Learning Guided by Color Transitions and Surface Texture", 13th International Conference on Security, Privacy and Applied Cryptographic Engineering (SPACE), 2023. Published in Springer Lecture Notes in Computer Science (LNCS), vol 14412. Springer, Cham. https://doi.org/10.1007/978-3-031-51583-5_11
- 11. S. Mandal, B. Ghosh and **R. Naskar**, "A Photoplethysmography (PPG) Sensor based Stress Level Monitoring System for Undergraduate Students of Technical Education", INDICON 2023 IEEE 20th India Council International Conference, NIT Warangal, India, 2023.
- 12.D. Das and **R. Naskar**, "High-Performance Image Splicing Detection utilizing Image Augmentation and Deep Learning", INDICON 2023 IEEE 20th India Council International Conference, NIT Warangal, India, 2023.
- 13.A. K. Das, S. Mukhopadhyay, A. Dalui, R. Bhattacharya and R. Naskar, "A Multi-Stage Multi-Modal Classification Model for DeepFakes Combining Deep Learned and Computer Vision Oriented Features", 19th International Conference on Information Systems Security (ICISS), NIT Raipur, pp. 217-226, Cham: Springer Nature Switzerland, 2023.
- 14. T. Ghosh and **R. Naskar**, "STN-Net: A Robust GAN-Generated Face Detector", 19th International Conference on Information Systems Security (ICISS), NIT Raipur, pp. 141-158, Cham: Springer Nature Switzerland, 2023.
- 15. T. Ghosh and **R. Naskar**, "Leveraging Image Gradients for Robust GAN-Generated Image Detection in OSN context", IEEE International Conference on Visual Communications and Image Processing (VCIP), Jeju, South Korea, 2023.
- 16. M. Paul and R. Naskar, "Deep Learning Enabled Pneumonia Detection From Chest X-rays: A Transfer Learning Based Ensemble Classification Approach", IEEE 3rd International Conference on Smart Technologies for Power, Energy and Control (STPEC), KIIT Bhubaneswar, 2023.
- 17.S. Das, D. Dutta, T. Ghosh and R. Naskar, "Universal Detection and Source Attribution of Diffusion Model Generated Images with High Generalization and Robustness", 10th International Conference on Pattern Recognition and Machine Intelligence (PReMI2023), ISI Kolkata, pp. 441-448, Cham: Springer Nature Switzerland, 2023.

- 18.A. K. Das, S. Mukhopadhyay, A. Dalui, R. Bhattacharya and R. Naskar, "Fighting Deepfakes by Detecting DCT Frequency Anomalies", Proceedings of IEEE International Conference on Devices, Circuits and Systems (ISDCS), Hiroshima University (Japan) in collaboration with IIEST Shibpur (India), 2023.
- 19.A. K. Das, V. Patidar and **R. Naska**r, "Artificial Synthesis of Single Person Videos through Motion Transfer using Cycle Generative Adversarial Networks and Machine Learning", 9th IEEE International Conference on Advanced Computing and Communication Systems (ICACCS), Chennai, India, 2023.
- 20. D. Das and **R. Naskar**, "Image Splicing Detection based on Deep Convolutional Neural Network and Transfer Learning", INDICON 2022 IEEE 19th India Council International Conference, Kerala, India, 2022.
- 21. D. Das, **R. Naskar** and R.S. Chakraborty, "Linear and Non-Linear Filter-based Counter-Forensics Against Image Splicing Detection", 7th International Conference on Computer Vision & Image Processing (CVIP), Nagpur, India, 2022.
- 22. D. Das and **R. Naskar**, "Image Splicing Detection Using Feature Based Machine Learning Methods and Deep Learning Mechanisms", 4th International Conference on Computational Intelligence in Pattern Recognition (CIPR), West Bengal, India, 2022.
- 23. A. Das and **R. Naskar**, "Audio Driven Artificial Video Face Synthesis Using Machine Learning Approaches", 4th International Conference on Computational Intelligence in Pattern Recognition (CIPR), West Bengal, India, 2022.
- 24. A. Roy and **R. Naskar**, "Improving Smart Cities Safety Using Sanity-Check Deep Neural Network Algorithm", 16th INDIACom 2022 9th IEEE International Conference on Computing for Sustainable Global Development, New Delhi, India, 2022. (Accepted)
- 25. S. Ahmed and **R. Naskar**, "Image Splicing Detection and Localisation using EfficientNet and Modified U-Net Architecture", 10th IEEE International Conference on Internet of Everything, Microwave Engineering, Communication and Networks (IEMECON 2021), Jaipur, India, 2021.
- 26. D. Banerjee and **R. Naskar**, "Deep Learning based Blind Source Identification of WhatsApp and Facebook Images", 15th INDIACom 2021 - 8th IEEE International Conference on Computing for Sustainable Global Development, New Delhi, India, 2021.
- 27. D. B. Tariang, S. C. Birudaraju, **R. Naskar**, V. Khare and R. S. Chakraborty, "Malware Classification Through Attention Residual Network based Visualization", IEEE Asian Hardware Oriented Security and Trust (AsianHOST), Kolkata, India, 2020.
- S. Mondal, D. Pushkar, M. Kumari and R. Naskar, "Forensic Source Identification of OSN Compressed Images", 16th International Conference on Information Systems and Security (ICISS) 2020, IIT Jammu, 2020.
- 29. J. B. Sarkar and **R. Naskar**, "A Curve Fitting Thresholding Approach for Forensic Source Identification of JPEG Compressed Images", 7th IEEE International Conference on Computing for Sustainable Global Development (INDIACom), pp. 22-28, New Delhi, India, 2020.
- 30. B. N. Sarkar, S. Barman and **R. Naskar**, "Blind Source Camera Identification of Online Social Network Images Using Adaptive Thresholding Technique", International Conference on Frontiers in Computing and Systems (COMSYS), Jalpaiguri, India, 2020.
- 31. A. Panda, **R. Naskar** and S. Pal, "An Image Texture Descriptor based Machine Learning Framework for Prediction of Thermo-Mechanic Heat Treatment Process in Plain Carbon Steel", 11th International Symposium on Image and Signal Processing and Analysis (ISPA), Dubrovnik, Croatia, 2019.
- 32. V. U. Sameer, **R. Naskar** and S. Modalavalasa, "Mitigating Adaptive PRNU Denoising (APD) in Camera Model Identification: An Anti-Counter Forensic Approach", IEEE TENCON 2019, Kochi, Kerala, India, 2019.
- 33. A. Panda, S. Rajbans, **R. Naskar** and S. Pal, "A 3D Wide Residual Network with Perceptual Loss for Brain MRI Image Denoising", 10th IEEE International Conference on Computing, Communication and Networking Technologies (ICCCNT), Kanpur, India, 2019.
- 34. R. Dixit and **R. Naskar**, "Copy-Rotate-Move Forgery Detection using Complex Wavelet Transform and Local Binary Pattern", 10th IEEE International Conference on Computing, Communication and Networking Technologies (ICCCNT), Kanpur, India, 2019.
- 35. D.B. Tariang, R.S. Chakraborty, **R. Naskar**, A. Roy and P. Sengupta, "Improved Detection and Localization for Copy-move Forgery Detection with Similar but Genuine Objects", Computer Vision and Pattern Recognition Workshops (CVPRW), Long Beach, California, USA, 2019.
- 36. S. Roy, A. Panda and **R. Naskar**, "An Automated Ensembled Deep Neural Network Approach towards Accurate Segmentation of Biomedical Images", IEEE International Conference on Wireless Communications, Signal Processing and Networking, (WiSPNET), 2019, Tamil Nadu, India.

- 37. V. Adabala and **R. Naskar**, "Hand Gesture Recognition Using Convolutional Neural Network", IEEE International Conference on Wireless Communications, Signal Processing and Networking, (WiSPNET), 2019, Tamil Nadu, India.
- 38. S. Roy, A. Panda and **R. Naskar**, "Unsupervised Ground Truth Generation for Automated Brain EM Image Segmentation", IEEE International Conference on Signal Processing & Integrated Networks (SPIN), 2019, Noida, India.
- 39. J. Bakas and **R. Naskar**, "A Digital Forensic Technique for Inter-Frame Video Forgery Detection based on 3D CNN", 14th International Conference on Information Systems and Security (ICISS) 2018, IISc Bangalore. Proceedings published in Lecture Notes in Computer Science (LNCS), vol. 11281, pp. 304-317.
- 40. J. Bakas, P. Rawat, K. Kokkalla and R. Naskar, "Re-compression based JPEG Tamper Detection and Localization using Deep Neural Network, Eliminating Compression Factor Dependency", 14th International Conference on Information Systems and Security (ICISS) 2018, IISc Bangalore. Proceedings published in Lecture Notes in Computer Science (LNCS), vol. 11281, pp. 318-341.
- 41. V. U. Sameer, I. Dali and R. Naskar, "A Deep Learning based Digital Forensic Solution to Blind Source Identification of Facebook Images", 14th International Conference on Information Systems and Security (ICISS) 2018, IISc Bangalore. Proceedings published in Lecture Notes in Computer Science (LNCS), vol. 11281, pp. 291-303.
- 42. J. Bakas, B.A. Kumar and **R. Naskar**, "MPEG Double Compression based Intra-Frame Video Forgery Detection using CNN", 17th IEEE International Conference on Information Technology (ICIT) 2018, Bhubaneswar India.
- 43. V. U. Sameer and R. Naskar, "Universal Wavelet Relative Distortion: A New Counter Forensic Attack on Photo Response Non-Uniformity based Source Camera Identification", 14th International Conference on Information Security Practice and Experience (ISPEC) 2018, Tokyo, Japan. Proceedings published in Lecture Notes in Computer Science (LNCS), vol. 11125, pp. 37-49.
- 44. A. Roy, D. B. Tariang, R. S. Chakraborty and **R. Naskar**, "Discrete Cosine Transform Residual Feature based Filtering Forgery and Splicing Detection in JPEG Images", Computer Vision and Pattern Recognition Workshops (CVPRW), Salt Lake City, Utah, USA, 2018.
- 45. V. U. Sameer, S. Mukhopadhyay, **R. Naskar** and I. Dali, "Source Camera Identification and Detection in Digital Videos through Blind Forensics", IEEE International Conference on Recent Trends in Computational Engineering and Technologies (ICRTCET) 2018, Bengaluru, India.
- 46. Vijaybhan, **R. Naskar** and S. Chinara, "Identification of Psoriasis Disease In Dermatology Using Machine Learning Technique", IEEE International Conference on Recent Trends in Computational Engineering and Technologies (ICRTCET) 2018, Bengaluru, India.
- 47. V.U. Sameer, R. Naskar, N. Musthyala and K. Kokkala, "Deep Learning based Counter-Forensic Image Classification for Camera Model Identification", 16th International Workshop on Digital Forensics and Watermarking (IWDW) 2017, Madgeburg, Germany. Proceedings published in Lecture Notes in Computer Science, vol. 10431, pp. 52-64, 2017.
- 48. A. Roy, R. S. Chakraborty, V.U. Sameer and **R. Naskar**, "Camera Source Identification Using Discrete Cosine Transform Residue Featuresand Ensemble Classifier", IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW) 2017, Honolulu, Hawai, USA.
- 49. D. B. Tariang, A. Roy, R. S. Chakraborty and **R. Naskar**, "Automated JPEG Forgery Detection with Correlation based Localization", IEEE International Conference on Multimedia and Expo (ICME) 2017, Hong Kong.
- 50. N. N. Dafale and **R. Naskar**, "Sensor Pattern Noise based Source Anonymization", IEEE Third International Conference on Sensing, Signal Processing and Security (ICSSS) 2017, Chennai, India.
- 51. P. Sengupta, V.U. Sameer, **R. Naskar** and E. Kalaimannan, "Source Anonymization of Digital Images: A Counter-Forensic Attack on PRNU based Source Identification Techniques", Annual Conference on Digital Forensics, Security and Law (ADFSL) 2017, Florida, USA.
- 52. V.U. Sameer, A. Sarkar and **R. Naskar**, "Copy-Move Forgery Detection Exploiting Statistical Image Features", IEEE International Conference on Wireless Communications Signal Processing and Networking (WisPNET) 2017, Chennai, India.
- 53. R. Dixit, **R. Naskar** and A. Sahoo, "Copy-Move Forgery Detection Exploiting Statistical Image Features", IEEE International Conference on Wireless Communications Signal Processing and Networking (WisPNET) 2017, Chennai, India.
- 54. V.U. Sameer, Sugumaran S., **R. Naskar**, "Digital Forensic Source Camera Identification with Efficient Feature Selection using Filter, Wrapper and Hybrid Approaches", 12th International Conference on Information Systems Security (ICISS 2016), Jaipur, India.

Proceedings published in Lecture Notes in Computer Science, vol. 10063, pp. 409-425, 2016.

- 55. A.M. Kandepu and **R. Naskar**, "Classification based Time-Efficient, Blind Source Camera Identification for Videos", 5th IEEE International Conference on Communication and Signal Processing (ICCSP) 2016, Tamilnadu, India.
- 56. D.B. Tariang and **R. Naskar**, "Re-Compressed based JPEG Forgery Detection and Localization through Automated Quality Factor Investigation", International Conference on Wireless Communications, Signal Processing and Networking (WiSPNET) 2016, Chennai, India.
- 57. R. Dixit and **R. Naskar**, "DyWT based Copy-Move Forgery Detection with Improved Detection Accuracy", International Conference on Signal Processing and Integrated Networks (SPIN) 2016, Noida, India.
- M. Shandilya, R. Naskar and R. Dixit, "Detection of Geometric Transformations in Copy-Move Forgery of Digital Images", 12th IEEE India International Conference INDICON 2015, New Delhi, India.
- 59. A. Roy, R. S. Chakraborty and **R. Naskar**, "Reversible Color Image Watermarking in the YCoCg-R Color Space", 11thInternational Conference on Information Systems Security (ICISS) 2015, Kolkata, India. Published in Lecture Notes in Computer Science, vol. 9478, pp. 480-498, 2015.
- 60. A. K. Yadav and **R. Naskar**, "A Tamper Localization Approach for Reversible Watermarking based on Histogram Bin Shifting", IEEE Power, Communication and Information Technology Conference (PCITC), 2015, Bhubaneswar, India.
- 61. J. Wadhwa, T. Ahemad, **R. Naskar** and R. Dixit, "On Parameterization of Block based Copy-Move Forgery Detection Techniques", ACM Research in Adaptive and Convergent Systems (RACS) 2015, Prague, Czech Republic. pp. 125-130, 2015.
- 62. P. Malviya and **R. Naskar**, "Digital Forensic Technique for Double Compression based JPEG Image Forgery Detection", International Conference on Information Systems Security (ICISS), 2014, Hyderabad, India. Published in Lecture Notes in Computer Science, vol. 8880, pp. 437-447, 2014.
- 63. **R. Naskar** and R. S. Chakraborty, "On Complexities of Spatial-domain Reversible Watermarking Algorithms", 8th INDIACom: International Conference on Computing for Sustainable Global Development 2014, New Delhi, India.
- 64. **R. Naskar**, A. Raju and R. S. Chakraborty, "High Throughput Reversible Watermarking Scheme for Audio based on Redundant Embedding", International Conference on Signal Processingand Communication (ICSC) 2013, Noida, Uttar Pradesh, India.
- 65. P. Nagaraju, **R. Naskar** and R. S. Chakraborty, "Improved Histogram Bin Shifting based Reversible Watermarking", International Conference on Intelligent System and Signal Processing (ISSP) 2013, Gujarat, India.
- 66. **R. Naskar** and R. S. Chakraborty, "Fuzzy Inference Rule based Reversible Watermarking for Digital Images", International Conference on Information Systems Security (ICISS), 2012, Guwahati, India. Published in Lecture Notes on Computer Science, vol. 7671, pp. 149-163, 2012.
- 67. **R. Naskar** and R. S. Chakraborty, "Lossless Secret Image Sharing based on Generalized-LSB Replacement", ACM Research in Applied Computation Symposium (RACS), San Antonio, Texas, USA, 2012.
- R. Naskar and R. S. Chakraborty, "Reversible Image Watermarking through Coordinate Logic Operation based Prediction", International Conference on Information Systems Security (ICISS) 2011, Kolkata, India. Published in Lecture Notes on Computer Science, vol. 7093, pp. 190-203, 2011.
- 69. **R. Naskar** and R. S. Chakraborty, "Lossless Data Hiding for Halftone Color Images", IEEE International Conference on Image Information Processing (ICIIP) 2011, Shimla, Himachal Pradesh, India.
- 70. S. Bandyopadhyay, R. Naskar and R. S. Chakraborty, "Reversible Watermarking Using Priority Embedding through Repeated Application of Integer Wavelet Transform", International Conference on Security Aspects in Information Technology, High-performance Computing and Networking (InfoSecHiComNet) 2011, Haldia, West Bengal, India. Published in Lecture Notes in Computer Science, vol. 7011, pp. 45-56, 2011.
- 71. S. Bandyopadhyay, **R. Naskar** and R. S. Chakraborty, "Reversible Digital Watermarking using Integer Wavelet Transform", Proceedings of International Conference on Scientific Paradigm Shift in Information Technology and Management (SPSITM) 2011, Kolkata, India.

RESEARCH FUNDING

- <u>Project Title:</u> "Affective recognition from human facial videos for fighting DeepFakes and validation by correlation with human physiological signals" <u>Funding Agency</u>: Science and Engineering Research Board (SERB), Govt. of India <u>Scheme</u>: EEQ <u>PI</u>: Dr. Ruchira Naskar <u>Duration</u>: 3 years (January 2024 - January 2027)
- <u>Project Title:</u> "Development of an IoT based forensic infrastructure for extraction, analysis and detection of cybercrime evidence from digital images and surveillance videos in an IoT framework" <u>Funding Agency</u>: Science and Engineering Research Board (SERB), Govt. of India <u>Scheme</u>: SERB Power Grant (SPG)
 <u>PI</u>: Dr. Ruchira Naskar
 <u>Co-PI</u>: Dr. Indrajit Banerjee (IIEST Shibpur)
 <u>Duration</u>: 3 years (October 2023 October 2026)
- <u>Project Title</u>: "Malware Executable Detection and Classification through Visualization and Machine Learning"
 <u>Funding Agency</u>: IIT Kharagpur AI4CPS I Hub Foundation
 <u>PI:</u> Prof. Rajat Subhra Chakraborty
 <u>Co-PI</u>: Dr. Ruchira Naskar
 <u>Duration</u>: 2 years (December 2023 December 2025)
- <u>Project Title:</u> "Digital Image Forensics in the Context of a Connected India: Algorithms and Implementation"
 <u>Funding Agency:</u> Dept. of Science and Technology (DST), Govt. of India
 <u>Scheme:</u> Interdisciplinary Cyber Physical Systems (ICPS) Programme
 <u>PI:</u> Dr. Rajat Subhra Chakraborty (IIT Kharagpur), Dr. Ruchira Naskar
 <u>Duration:</u> 3 years (September 2019 – September 2022)
- <u>Project Title:</u> "Image manipulation detection in social networks based on forensic investigation of re-compression artefacts" <u>Funding Agency:</u> Technical Education Quality Improvement Programme-III (TEQIP-III), Govt. of India
 <u>PI:</u> Dr. Ruchira Naskar <u>Duration:</u> 1 year (January 2020 - January 2021)
- <u>Project Title:</u> "Development of a Digital Forensic System for Blind Source Camera Identification of Contentious Images using Machine Learning"
 <u>Funding Agency:</u> Council of Scientific and Industrial Research (CSIR), Govt. of India <u>Scheme:</u> Extra Mural Research
 <u>PI</u>: Dr. Ruchira Naskar
 <u>Duration</u>: 3 years (August 2017 August 2020)
- <u>Project Title:</u> "Detection of Cyber Forgery in Multimedia Data through Blind Digital Forensics" <u>Funding Agency</u>: Board of Research in Nuclear Sciences (BRNS), DAE, Govt. of India <u>Scheme</u>: Young Scientist Research Award <u>PI:</u> Dr. Ruchira Naskar <u>Duration</u>: 3 years (November 2016 - November 2019)
- <u>Project Title:</u> "Digitization of steel microstructure images, modelling of plain carbon steel microstructure evolution during heat treatment using cellular automata and phase field modeling methods, and development of a software tool for providing guidance in designing heat treatment process using machine learning based classification techniques"
 <u>Funding Agency:</u> Science and Engineering Research Board (SERB), DST, Govt. of India Scheme: Early Career Research
 <u>PI:</u> Dr. Ruchira Naskar
 <u>Co-PI:</u> Dr. Snehanshu Pal (NIT Rourkela)
 <u>Duration</u>: 3 years (August 2016 August 2019)
- **<u>Project Title:</u>** "Image Source Device Identification and Authentication based on Machine Learning Techniques"

<u>Funding Agency:</u> Media Asia Lab, Dept. of Electronics and Information Technology (DEITY), Govt. of India <u>Scheme</u>: Visveswaraya PhD Scheme <u>PI:</u> Dr. Ruchira Naskar <u>Duration:</u> 5 years (July 2015 - June 2020)

 <u>Project Title:</u> "Development of Software for Cyber Crime Detection" <u>Funding Agency:</u> Technical Education Quality Improvement Programme-II (TEQIP-II), NIT Rourkela
 <u>PI:</u> Dr. Ruchira Naskar <u>Duration:</u> 1 year (November 2014 - October 2015)

ACADEMIC ACHIEVEMENTS

- Research by Ph.D. scholar Mr. Rajat Chakraborty on "Identifying Deepfakes based on Human Physiological Signals", selected for presentation at the Doctoral Consortium of 27th International Conference on Pattern Recognition (ICPR), 2024.
- Research by Ph.D. scholar Ms. Tanusree Ghosh on "GAN and DM Generated Synthetic Image Detection in the Age of Misinformation", selected for presentation at the Doctoral Consortium of 27th International Conference on Pattern Recognition (ICPR), 2024.
- "POSTER: GAN and DM Generated Synthetic Image Detection in the Age of Misinformation" accepted for presentation at ACNS 2024, at NYU, Abu Dhabi, UAE. [**Conference costs covered under ACNS Student Travel Grant won by Ph.D. student Ms. Tanusree Ghosh]
- Recipient of SERB International Travel Grant for attending the 38th IEEE VCIP 2023.
- 2nd Prize in Best Student Research Presentation Award at PReMI 2023 won by Ph.D. scholar Tanusree Ghosh in December, 2023, ISI Kolkata.
- Best Paper Award in INDICON 2022 for paper titled "Image Splicing Detection based on Deep Convolutional Neural Network and Transfer Learning" ("Emerging Technologies for Secure Computing" track).
- Recipient of "SERB Power Grant" (2023) by Science and Engineering Research Board (SERB), Govt. of India.
- Invited to deliver a talk on "Digital Multimedia Security and Testing" in the 14th National Workshop on Recent Trends in Software Testing (RTST-2021), 2021.
- Invited to deliver a talk on "Digital Forensics" in the All India Council for Technical Education (AICTE) Training And Learning (ATAL) Academy funded Faculty Development Program organized by NIT Rourkela in 2021.
- Recipient of IEEE Computer Society Early Career Young Women Scientists Fellowship (2019) to attend the IEEE Asian Test Symposium 2019.
- Recipient of "Young Scientist Research Award" (2016) by Board of Research in Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), Govt. of India.
- Recipient of "Early Career Research Award" (2016) by Science and Engineering Research Board (SERB), Department of Science and Technology (DST), Govt. of India.
- Invited to deliver a talk on "Digital Content Protection through Reversible Watermarking" at the 18th International Symposium on VLSI Design and Test (VDAT), July 2014, Coimbatore, India.
- Invited to chair a session on "FPGA and Hardware Acceleration" at 18th International Symposium on VLSI Design and Test (VDAT), 2014.
- Winner of the 1st IDRBT Doctoral Colloquium (2011), conducted by Institute for Development & Research in Banking Technology (IDRBT), established by the Reserve Bank of India, for a personal presentation on Ph.D. research proposal. Award includes Rs. 50,000 cash prize and citation.
- Recipient of "Foreign Travel Fellowship Award" by Department of Science and Technology, Govt. of India, to attend ACM RACS'12 conference in San Antonio, Texas (USA).
- Invited to attend the 2011 Women in Technology and Science Meet, GE Bangalore.
- Selected to participate in the "Summer School on Security and Privacy (2011)" organized by Microsoft Research India.
- Recipient of Intellectual Ventures (India) Invention Award for invention titled "Reversible Watermarking of Color Images by Histogram-Bin-Shifting of Color Components" (Invention ID: IN-815068).
- Secured 99.79 percentile and All India Rank 11 in GATE (IT) 2008.
- Ranked 2nd in Master of Technology (M.Tech) in the School of Information Technology, Indian Institute of Technology, Kharagpur, batch 2008-2010.
- Received MHRD (India) scholarship in engineering from July 2008 to June 2010.

- Received Institute Ph.D. Scholarship, Indian Institute of Technology, Kharagpur, from July 2010 to October 2013.
- Qualified the Junior Research Fellowship (JRF) Selection Test for admission to Ph.D. Program of Indian Statistical Institute (ISI), Kolkata, 2010.

PROFESSIONAL ACTIVITIES

- Member of Subject Expert Committee for Engineering Sciences III: Computer Engineering for the Prime Minister Early Career Research Grant (PMECRG) program of Anusandhan National Research Foundation (ANRF), January 2025
- Associate Editor, IET Image Processing, since November, 2024
- Journal Reviewer

IEEE Transactions on Cybernetics, IEEE Transactions on Computational Social Systems, IEEE Transactions on Image Processing, IEEE Transactions on Cybernetics, IEEE Transactions on Information Forensics and Security, Journal of Visual Communication and Image Representation (Elsevier), Signal Processing: Image Communication (Elsevier), Multimedia Tools and Applications (Springer), IET Image Processing, IET Computer Vision

- Conference Reviewer ICISS 2024, INDICON 2024, ICISS 2023, INDICON 2023, ICMC 2021, ICISS 2017, ICISS 2016, RACS 2016, SPACE 2014, ICISS 2014, ICACC 2014, ACM RACS 2012
- Program Committee Member INDICON 2024, INDICON 2023, ISDCS 2022, ICMC 2021, ICISS 2017, DaSAA 2016, CGVIS 2017, ICISS 2016, RACS 2016, ICISS 2015, SPACE 2015, ACC 2015, NGCT 2015
- Organized and acted as the convener of "Webinar on Recent Trends and Applications in Machine Learning", sponsored by TEQIP, IIEST Shibpur, held during February 2021 at Indian Institute of Engineering Science and Technology, Shibpur.
- Organized and acted as the convener of "National Workshop on Software Quality Assurance" sponsored by CSIR and PwC, Washington DC, held during July, 2015 at National Institute of Technology, Rourkela, India.
- Organized and acted as the convener of "One Day Workshop on Emerging AI Cyber Security Challenges", sponsored by SERB, GoI, held during 13th September, 2024 at Indian Institute of Engineering Science and Technology, Shibpur.

ADMINISTRATIVE ACTIVITIES

- Associate Dean, Academic (PG & PhD), IIEST Shibpur (February 2025 Till Date)
- Deputy Chief Information Security Officer (DyCISO), IIEST Shibpur, 2023 Till Date
- Convenor, Ordinance Modification Committee, IIEST Shibpur (2024 2025)
- Convener of Departmental Training and Placement Committee, IIEST Shibpur (2019 2023)
- Assistant Warden, KMS Hall of Residence, NIT Rourkela (September 2017 May 2019)
- PIC, Digital Forensic Research Laboratory, Dept of CSE, NIT Rourkela (August 2016 May, 2019)
- PIC, Students' Activity Center, NIT Rourkela (August 2016 September 2018)
- Faculty Advisor, M.Tech., CSE, NIT Rourkela (July 2015 May 2017)
- Member JoSAA, IIEST Shibpur, 2023-24
- Member JoSAA, IIEST Shibpur, 2021-22
- Member CCMT, IIEST Shibpur, 2020-21