

Dr. Manisha Verma

Assistant Professor
Mathematics and Computing
IIT (ISM) Dhanbad
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EDUCATION *Doctor of Philosophy* April 2016
Mathematics Department, IIT Roorkee, India
Thesis title: New Feature Descriptors for Image Retrieval, Object Tracking and Shot Detection
(CGPA 8.85/10)

Master of Science in Industrial Mathematics and Informatics June 2012
Mathematics Department, IIT Roorkee, India
(CGPA 8.67/10, class Rank 2/14)

Bachelor of Science June 2009
Rajasthan University, Rajasthan, India
Subjects: Mathematics, Physics, and Computer Application
(Percentage: 73.48 %)

EXPERIENCE *Assistant Professor* Sept 2023-Present
Mathematics & Computing, Indian Institute of Technology (ISM) Dhanbad

Researcher Aug 2018-March 2022
Institute for Dataability Science, Osaka University, Japan

Postdoctoral Fellow Nov 2016-Oct 2017
Electrical Engineering, Indian Institute of Technology Gandhinagar, India

Research Associate Aug 2016-Oct 2016
Electrical Engineering, Indian Institute of Technology Gandhinagar, India

PUBLICATIONS *Journal*

1. L. Li, **M. Verma**, B. Wang, Y. Nakashima, R. Kawasaki, H. Nagahara “Automated Grading System of Retinal Arterio-venous Crossing Patterns: A Deep Learning Approach Replicating Ophthalmologist’s Diagnostic Process of Arteriosclerosis”, *PLOS Digital Health*, 2022.
2. B. Wang, L. Li, **M. Verma**, Y. Nakashima, R. Kawasaki, H. Nagahara, “Match them up: visually explainable few-shot image classification”, *Applied Intelligence*, pp. 1-22, 2022. (IF 5.019)
3. S. Kumawat, **M. Verma**, Y. Nakashima and S. Raman, “Depthwise Spatio-temporal STFT Convolutional Neural Networks for Human Action Recognition”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 2021. (IF 24.31)
4. **M. Verma** and B. Raman, “Local Neighborhood Difference Pattern: A New Feature Descriptor for Natural and Textural Image Retrieval”, *Multimedia Tools and Applications*, pp. 1-24, 2017. (IF 2.577)

5. **M. Verma** and B. Raman, “Local Tri-Directional Patterns: A New Feature Descriptor for Texture and Face Image Retrieval”, *Digital Signal Processing*, Elsevier, vol. 51, pp. 62-72, 2016 (IF 2.92).
6. M. Dey, B. Raman and **M. Verma**, “A Novel Colour and Texture based Image Retrieval Technique using Multi-resolution Local Extrema Peak Valley Pattern and RGB Colour Histogram”, *Pattern Analysis and Applications*, Springer, vol. 19(4), pp. 1159-1179, 2016 (IF 2.307).
7. **M. Verma**, B. Raman and S. Murala, “Local Extrema Co-occurrence Pattern for Color and Texture Image Retrieval”, *Neurocomputing*, Elsevier, vol. 165, pp. 255-269, 2015. (IF 5.779)
8. **M. Verma** and B. Raman, “Center Symmetric Local Binary Co-occurrence Pattern for Texture, Face and Bio-medical Image Retrieval”, *Journal of Visual Communication and Image Representation*, Elsevier, vol. 32, pp. 224-236, 2015. (IF 2.887)

(To be submitted)

1. D. Ma, X. Tao, Z. Niu, J. Zhou, **M. Verma**, L. Li, Supervoxel Based Learning Interpretable Method for Action Quality Assessment.

Conference

1. **M. Verma**, Y. Nakashima, N. Takemura, H. Nagahara, “Multi-label Disengagement and Behavior Prediction in Online Learning”, in *Artificial Intelligence in Education (AIED)*, pp. 633-639, Durham University, UK, 2022. (CORE A)
2. S. Yadav, G. Singh, **M. Verma**, K. Tiwari, H. Pandey, S. A. Akbar, P. Corcoran, “YogaTube: A Video Benchmark for Yoga Action Recognition”, in *IEEE International Joint Conference on Neural Networks (IJCNN)*, pp. 1-8, Padua, Italy, 2022. (CORE B)
3. L. Li, B. Wang, **M. Verma**, Y. Nakashima, R. Kawasaki, H. Nagahara, “SCOUTER: Slot Attention-based Classifier for Explainable Image Recognition”, in *International Conference on Computer Vision (ICCV)*, pp. 1046-1055, Montreal, Canada, 2021. (virtual, CORE A*)
4. **M. Verma**, Y. Nakashima, H. Kobori, R. Takaoka, N. Takemura, T. Kimura, H. Nagahara, M. Numao, K. Shinohara, “Learners’ Efficiency Prediction Using Facial Behavior Analysis”, in *IEEE International Conference on Image Processing (ICIP)*, pp. 1084-1088, Alaska, USA, 2021. (virtual, CORE B)
5. B. Wang, L. Li, **M. Verma**, Y. Nakashima, R. Kawasaki, H. Nagahara, “MTUNet: Few-Shot Image Classification With Visual Explanations”, in *IEEE/CVF Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, pp. 2294-2298, Nashville, USA, 2021. (virtual)
6. **M. Verma**, S. Kumawat, Y. Nakashima, S. Raman, “Yoga-82: A New Dataset for Fine-grained Classification of Human Poses”, *IEEE Conference on Computer Vision and Pattern Recognition Workshops (CVPRW)*, pp. 1038-1039, Seattle, USA, 2020. (virtual)
7. L. Li, **M. Verma**, Y. Nakashima, H. Nagahara, Ryo Kawasaki, “Joint Learning of Vessel Segmentation and Artery/Vein Classification with Post-processing”, in *Medical Imaging with Deep Learning (MIDL), Proceedings of Machine Learning Research*, pp. 440-453, Montreal, Canada, 2020. (virtual)
8. L. Li, **M. Verma**, Y. Nakashima, H. Nagahara, R. Kawasaki, “IterNet: Retinal Image Segmentation Utilizing Structural Redundancy in Vessel Networks”, in

- Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, pp. 3656-3665, Colorado, USA, 2020. (CORE A)
9. **M. Verma**, H. Kobori, Y. Nakashima, N. Takemura and H. Nagahara, "Facial Expression Recognition with Skip-connection to Leverage Low-level Features", in *IEEE International Conference on Image Processing*, pp. 51-55, Taipei, Taiwan, 2019. (CORE B)
 10. S. Kumawat, **M. Verma** and S. Raman, "LBVCNN: Local Binary Volume Convolutional Neural Network for Facial Expression Recognition from Image Sequences", in *IEEE Conference on Computer Vision and Pattern Recognition Workshop (CVPRW)*, Long Beach, USA, 2019.
 11. **M. Verma**, R. Ghosh, and S. Raman, "Saliency Driven Video Motion Magnification", in *Proceedings of National Conference on Computer Vision, Pattern Recognition, Image Processing and Graphics (NCVPRIPG)*, Springer, vol. 841, pp. 89-100, Mandi, India, 2017.
 12. **M. Verma** and S. Raman, "Interest Region based Motion Magnification", in *Proceedings of 19th International Conference on Image Analysis and Processing (ICIAP)*, Lecture Notes in Computer Science, Springer, vol 10484, pp. 27-39, Catania, Italy, 2017. (CORE B)
 13. **M. Verma** and S. Raman, "Edge-Aware Spatial Filtering Based Motion Magnification", in *Proceedings of The 2nd International Conference on Computer Vision and Image Processing (CVIP)*, Advances in Intelligent Systems and Computing, Springer, vol. 704, pp. 117-128, Noida, India, 2017.
 14. **M. Verma** and B. Raman, "A Hierarchical Shot Boundary Detection Algorithm using Global and Local Features", in *Proceedings of International Conference on Computer Vision and Image Processing*, Advances in Intelligent Systems and Computing, Springer, vol 460, pp. 389-397, Roorkee, India, 2016.
 15. **M. Verma**, N. Sood, P. Partim Roy and B. Raman, "Script identification in natural scene images: A Dataset and Texture-feature based Performance Evaluation", in *Proceedings of International Conference on Computer Vision and Image Processing (CVIP)*, Advances in Intelligent Systems and Computing, Springer, vol 460, pp. 309-319, Roorkee, India, 2016.
 16. **M. Verma** and B. Raman, "Object Tracking using Joint Histogram of Color and Local Rhombus Pattern", in *Proceedings of IEEE International Conference on Signal and Image Processing Applications (ICSIPA)*, pp. 77-82, Kuala Lumpur, Malaysia, 2015. (**Best student paper award**)
 17. A. Rani, **M. Verma** and B. Raman, "Fusion of Submanifold and Local Texture Features for Palmprint Authentication", in *Proceedings of International Conference on Visual Communications and Image Processing (VCIP)*, pp. 1-4, Singapore, 2015. (CORE B)
 18. **M. Verma**, B. Raman and S. Murala, "Wavelet Based Directional Local Extrema Patterns for Image Retrieval on Large Image Database", in *Proceedings of IEEE International Conference on Advances in Computing and Communication Engineering (ICACCE)*, pp. 649-654, Dehradun, India, 2015.
 19. **M. Verma**, B. Raman, S. Murala, "Multi-resolution local extrema patterns using discrete wavelet transform", in *Proceedings of IEEE International Conference on Contemporary Computing (IC3)*, pp. 577-582, Noida, India, 2014.

RESEARCH GRANTS

- “Advancing Retinal Disease Prediction Utilizing Deep Learning”, FRS Grant, IIT (ISM) Dhanbad of 19.5 Lakh. (Approved)
- “AI-Driven Cervical Cancer Detection: Addressing Data Scarcity, Generalization, and Interpretability Challenges”, SERB Early Career Grant. (In process)

ACADEMIC SERVICES

Reviewer Journal

- Pattern Recognition, IEEE Transactions on Multimedia, Computer Vision and Image Understanding, Journal of Visual Communication and Image Understanding, Multimedia Tools and Applications, Sensors MDPI, Applied Sciences MDPI

Reviewer Conference

- CVPR 2025, WACV 2025, CVIP 2024, ICLR 2024, ECCV 2022, CVPR 2022, CVPR 2021 (**Outstanding reviewer award**), ICLR 2022, WACV 2022, AAAI 2021, ECCV 2020, CVIP 2021, CVIP 2020

Conference Committee

- ICMC 2025 (Track chair)
- CVIP 2024 (Publicity and Session chair)
- CVIP 2021 (Area chair)

Topical Advisory Panel

- Sensors MDPI

ACADEMIC ACHIEVEMENTS

- Outstanding Reviewer award in CVPR 2021.
- The best paper award for paper in the 4th IEEE International Conference on Signal and Image Processing Applications held at Kuala Lumpur, Malaysia, 19-21 Oct 2015.
- PhD Fellowship, Ministry of Human Research & Development, India.
- Qualified Graduate Aptitude Test for Engineering (GATE), 2012.
- Won merit-cum-means scholarship two times during M.Sc., IIT Roorkee.
- Qualified Joint Admission Test for M.Sc. (JAM), 2010.

WORKSHOP AND CONFERENCES ATTENDED

Conferences

- 9th International Conference on Computer Vision and Image Processing (CVIP), 19th-21st Dec 2024, IIITDM Kancheepuram, Chennai.
- International Conference on Computer Vision (ICCV), 11th-17th Oct, 2021, Virtual.
- International Conference on Image Processing (ICIP), 19th-22nd Sept, 2021, Virtual.
- International Conference on Medical Imaging with Deep Learning (MIDL), 6th-9th July 2020, Virtual.
- Conference on Computer Vision and Pattern Recognition (CVPR), 14th-19th June 2020, Virtual.
- International Conference on Image Processing (ICIP), 22th-25th Sept, 2019, Taipei, Taiwan.
- International Conference on Image Analysis and Processing (ICIAP), 11th-15th Sept 2017, Catania, Italy.
- International Conference on Computer Vision and Image Processing (CVIP), 26th-28th Feb, 2016, Roorkee, India.
- International Conference on Signal and Image Processing Applications (ICSIPA), 19th-21st Oct 2015, Kuala Lumpur, Malaysia.
- International Conference on Advances in Computing and Communication Engineering (ICACCE), 1st-2nd May 2015, Dehradun, India.

- International Conference on Contemporary Computing (IC3), 7th-9th August 2014, Noida, India.

Workshops

- Workshop on Brain, Computation and Learning: 9th-13th Jan 2017, IISC Bangalore, India.
- Research Promotion Workshop on Introduction to Graph and Geometric Algorithms: 6th-8th March 2014, IIT Roorkee, India.
- Biometrics and Privacy Protection: 23rd-25th Dec 2013, MNIT Jaipur, India.

MEMBERSHIPS

- IEEE Member
- International Association of Pattern Recognition (IAPR) member through Indian Unit for Pattern Recognition and Artificial Intelligence (IUPRAI)
- Computer Vision Foundation (CVF)