Tushar Nayak

tusharnayak@outlook.com tusharn@andrew.cmu.edu
/in/nayaktushar foundhere.technology/tushar
ORCiD (0000-0002-4328-7983) Google Scholar (9xUX7NoAAAAJ)

Experience

Mar 2024 – Jul 2024	**Research Intern,** Indian Council of Medical Research
June 2024 – Jul 2024	**Project Intern,** Worcester Polytechnic Institute
Aug 2023 – May 2024	**Research/Project Associate,** Indian Institute of Technology - Hyderabad
Jan 2023 – Mar 2023	**Research Intern,** CETAS Healthcare
Jul 2022 – Aug 2022	**Hospital Intern,** TBS Telematic and Biomedical Services

Education

2024 – · · · ·

M.S. Biomedical Engineering - Research
College of Engineering, Carnegie Mellon University.
PITTSBURGH, PENNSYLVANIA, USA
Focus Areas: Medical Imaging and Informatics, Medical Robotics & Neuroengineering

2019 – 2023

B.Tech. Biomedical Engineering
Minor in Data Science
Manipal Institute of Technology, Manipal Academy of Higher Education.
MANIPAL, KARNATAKA, INDIA
Capstone Thesis: *Deep Learning Based Multi-Modal Multi-Stage Detection of Oral Cancer.*

Research Publications

Journal Articles

1. **T. Nayak**, N. Gokulkrishnan, K. Chadaga, N. Sampathila, H. Mayrose, and S. KS, "Automated histopathological detection and classification of lung cancer with an image pre-processing pipeline and spatial attention with deep neural networks," *Cogent Engineering*, vol. 11, no. 1, p. 2 357 182, 2024. DOI: 10.1080/23311916.2024.2357182.
2. **T. Nayak**, K. Chadaga, N. Sampathila, *et al.*, "Deep learning based detection of monkeypox virus using skin lesion images," *Medicine in Novel Technology and Devices*, p. 100 243, 2023. DOI: 10.1016/j.soh.2023.100040.
3. **T. Nayak**, K. Chadaga, N. Sampathila, *et al.*, "Detection of monkeypox from skin lesion images using deep learning networks and explainable artificial intelligence," *Applied Mathematics in Science and Engineering*, vol. 31, no. 1, p. 2 225 698, 2023. DOI: 10.1080/27690911.2023.2225698.
4. H. Mayrose, N. Sampathila, G. M. Bairy, **T. Nayak**, S. Belurkar, and K. Saravu, "An explainable artificial intelligence integrated system for automatic detection of dengue from images of blood smears using transfer learning," *IEEE Access*, pp. 1–1, 2024. DOI: 10.1109/ACCESS.2024.3378516.
5. **T. Nayak** and N. Sampathila, "Automated oral squamous cell carcinoma detection from histopathological images using deep neural networks," *Journal of Biomedical Engineering Society of India, Vol. 17*, 2023. URL: https://t.ly/P1Md3.
6. N. Gokulkrishnan, **T. Nayak**, N. Sampathila, L. Dalmia, and R. Laghate, "Binary detection of acute lymphocytic leukemia using blood smear images using deep learning models," *Journal of Biomedical Engineering Society of India, Vol. 17*, 2023. URL: https://t.ly/P1Md3.

Conference Proceedings

1. **T. Nayak**, N. Sampathila, and N. Gokulkrishnan, "Processing and detection of lung and colon cancer from histopathological images using deep residual networks," in *2023 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT)*, IEEE, 2023, pp. 1–6. DOI: 10.1109/CONECCT57959.2023.10234757.
2. N. Gokulkrishnan, **T. Nayak**, and N. Sampathila, "Deep learning-based analysis of blood smear images for detection of acute lymphoblastic leukemia," in *2023 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT)*, IEEE, 2023, pp. 1–5. DOI: 10.1109/CONECCT57959.2023.10234824.
3. H. Mayrose, N. Sampathila, G. M. Bairy, **T. Nayak**, S. Belurkar, and K. Saravu, "Deep learning approach for detection of dengue fever from the microscopic images of blood smear," in *Journal of Physics: Conference Series*, IOP Publishing, vol. 2571, 2023, p. 012 005. DOI: 10.1088/1742-6596/2571/1/012005.

Skills

Programming	Python, MATLAB, R, C++, C, Visual Basic, .NET, LaTeX, …
CV Libraries	TensorFlow, Keras, PyTorch, OpenCV.
Deep Learning	Convolutional Neural Networks, Graph Neural Networks, Generative Adversarial Networks, Long Short-Term Memory Networks, Autoencoders, Recurrent Neural Networks, Attention Mechanisms, Transformers, Regularization Techniques.
Machine Learning	Support Vector Machines, Random Forests & Decision Trees, Gaussian Processes, Bayesian Neural Networks
Signal Processing	Filter Design, Signal Reconstruction, Noise Reduction, Feature Extraction, Time Series & Spectral Analysis, Statistical Signal Processing
Image Processing	Image Filtering, Feature Enhancement & Extraction, Segmentation, Object Detection, Texture Analysis, Morphological Analysis, Compression, Color Processing.
Assembly	INTEL 8051 MCU, INTEL 8086 AP
Ckt. Simulation	SIMULINK, PSpice, LTspice.
Web Dev	HTML, Css, JavaScript.
Languages	English, Hindi, French, Marathi

Technical and Co-Curricular Activities

March 2022 – · · · ·	**Editor in Chief,** Open Horizon Robotics
Jul 2022 – May 2023	**Chairperson & Head of Research,** IEEE EMBS Student Chapter Manipal
Jul 2021 – Jun 2022	**Secretary & Webmaster,** IEEE EMBS Student Chapter Manipal
Feb 2022 – Mar 2023	**Head of IT and Webmaster,** IEEE RAS Student Chapter Manipal
Jul 2020 – Oct 2021	**Tech-Comm, Tech and Editorial Committee Committee,** BMESI Manipal

Extra-Curricular and Non-Technical Activities

Jan 2015 – · · · ·	**Blogger,** TechnologyFoundHere https://foundhere.technology/
April 2015 – May 2015	**Content Creator,** NODWIN Gaming
Jan 2019 – Mar 2019	**Tech Writer,** TechQuila techquila.co.in/author/tushar/
Feb 2019 – April 2019	**Staff Writer,** The MIT Post themitpost.com/author/tushar/
2006 – · · · ·	**Amateur Keyboardist and Pianist,** Trinity College London (Keyboard).

Awards

- **Biomedical Engineering Department Head's Fellowship**, College of Engineering at Carnagie Mellon University (March 2024)
- **Best Paper - AI Track**, 2nd International Conference on Artificial Intelligence, Computational Electronics and Communication System (March 2023)

References

Dr. Niranjana Sampathila
Professor & Head
Department of Biomedical Engineering
Manipal Institute of Technology.
niranjana.s@manipal.edu

Mrs. Hilda Mayrose
Assistant Professor (Sr. Scale)
Department of Biomedical Engineering
Manipal Institute of Technology.
hilda.mayrose@manipal.edu