Jitesh Joshi

jitesh.joshi.20@ucl.ac.uk LinkedIn GitHub Webpage

Professional Summary

Research Scientist with expertise in machine learning, computer vision, and deep learning, specializing in robust AI systems and trustworthy deployments. Published in top-tier conferences (NeurIPS, BMVC) with focus on attention mechanisms and out-of-distribution generalization. Demonstrated experience in developing and deploying large-scale AI solutions, with particular emphasis on model robustness and reliable system implementation. Strong track record in collaborative research environments and delivering high-impact projects.

Education

- **Ph.D. Candidate | University College London, UK (2020–2025)**
  Thesis Title: Enhancing Out-of-distribution Generalization for Robust Camera-based Remote Physiological Sensing.
  • Developed novel approaches for multi-dimensional attention mechanisms with a potential to influence the broader field of computer vision and machine learning, particularly in scenarios requiring robust extraction of weak signals from spatial-temporal features in noisy environments.
  • Comprehensive contributions to both the theoretical and applied aspects of machine learning, combining novel mathematical frameworks, efficient architecture design, and robust empirical validation.
  • Advisors: Prof. Youngjun Cho ( ), Prof. Nadia Berthouze ( )
- **M.Sc., Cognitive Systems & Interactive Media | Pompeu Fabra University, Spain (2010–2011)**
  Research Area: EEG-based Investigation of Brain Wave Entrainment by Binaural Beats & Music.
  • Applied machine learning techniques to analyze complex neurophysiological data.
  • Developed robust signal processing pipelines for real-time analysis.
  • Advisors: Dr. Sylvain Le Groux ( ), Prof. Paul Verschure ( )
- **B.Tech., Electronics & Communication | Nirma University, India (2004–2008)**
  • Focus: Signal Processing, Digital System Design, Modern Processor Architecture

Work Experience [Employment History]

- **Research Associate** | University College London (2024 – Present)
  • Leading research on generative AI and diffusion models for photorealistic image synthesis.
  • Developing novel approaches for multi-modal semantic segmentation with emphasis on model robustness.

- **Solution Architect -AI** | Tata Elxsi (2016 – 2024)
  • Led development of robust AI systems for healthcare applications, including edge-computing solutions for dense object detection for enumerating several micro-organisms, as well as optics and imaging based point-of-care diagnostic device for Sickle-cell disease and Malaria detection, resulting in three patents and successful deployments.
  • Managed cross-functional teams and high-impact client projects exceeding $1M, ensuring regulatory compliance and on-time delivery through comprehensive planning, and risk analysis.
  • Mentored and led a team of 10+ AI engineers, providing technical guidance on deep learning and computer vision while contributing to strategic planning and business development initiatives.

- **Sr. Scientist - R&D** | Azoi Inc (2014 – 2016)
  • Developed robust algorithms for real-time physiological sensing.
  • Implemented comprehensive validation frameworks for medical device certification.

Selected Publications and Patents

1. **J. Joshi**, S. Agaian, and Y. Cho, "FactorizePhys: Matrix factorization for multidimensional attention in remote physiological sensing," in *The Thirty-eighth Annual Conference on Neural Information Processing Systems*, 2024. URL: https://openreview.net/forum?id=qrfp4eeZ47.
2. **J. Joshi** and Y. Cho, "iBVP Dataset: RGB-Thermal rPPG dataset with high resolution signal quality labels," *Electronics*, vol. 13, no. 7, p. 1334, 2024, ISSN: 2079-9292. URL: https://www.mdpi.com/2079-9292/13/7/1334.
3. **J. Joshi**, N. Bianchi-Berthouze, and Y. Cho, "Self-adversarial multi-scale contrastive learning for semantic segmentation of thermal facial images," in *33rd British Machine Vision Conference 2022, BMVC 2022, London, UK, November 21-24, 2022*, BMVA Press, 2022. URL: https://bmvc2022.mpi-inf.mpg.de/0864.pdf.
4. T. Tran, H. Watson, **J. Joshi**, and R. Patel, "Compensation of intensity variances in images used for colony enumeration," 2021. URL: https://patents.google.com/patent/WO2021229337A1.
5. T. Tran, H. Watson, **J. Joshi**, A. SK, and R. Tiwari, "Detecting a condition for a culture device using a machine learning model," 2021. URL: https://patents.google.com/patent/WO2021234514A1.

Awards and Achievements

2020 **Project Excellence Awards, Tata Elxsi**
- Led the design of an AI-based edge imaging device for automated bacterial colony counting.

2019 **Hackathon Winner, Tata Elxsi**
- Developed AI-based medical image enhancement solution.

2018 Prestigious **Tata Innovista** Award
- Contributed to the development of point-of-care diagnostic device for malaria and sickle cell disease URL.

Technical Skills

Machine Learning: Deep learning architectures, attention mechanisms, transformer networks, diffusion models, contrastive learning, out-of-distribution robustness.

Domain Expertise: Computer vision, physiological computing, medical imaging, edge computing, system design.

Frameworks: PyTorch, TensorFlow, Python, C++

Professional: System engineering, project management, risk analysis, technical documentation.

Certifications

2025 **Generative AI with Large Language Models** (Coursera).

2019 **Executive Data Science Specialization** (Coursera).

2018 **Deep Learning Specialization** (Coursera).

References

Available upon request