Jitesh Joshi

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Professional Summary

Research Scientist with expertise in developing deep-learning learning architectures for multi-modal vision as well as time-series data. Specialized in designing robust attention mechanisms and representation learning approaches to enhance domain generalization. Demonstrated success bridging theoretical machine learning advances with practical healthcare applications through published work at top-tier conferences (NeurIPS, BMVC) and industry patents. Passionate about applying AI to complex biomedical challenges, with a focus on combining computer vision, deep learning, and domain knowledge to extract meaningful insights from high-dimensional data.

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** and Y. Cho, "Efficient and Robust Multidimensional Attention in Remote Physiological Sensing through Target Signal Constrained Factorization," *In Review*, 2025.
2. **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.
3. **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.
4. **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.
5. 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.
6. 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