Harshit Bokadia

AI/ML Engineer and Computational Neuroscience Researcher | Scientific Programmer| Applied Scientist

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| scholar.google.ca/citations?user=QxgwOOcAAAAJ&hl=en&oi=ao | github.com/hbk008

Summary| Skills

AI Engineer with over 7 years of experience designing, developing, and deploying machine learning models and data-driven systems for research and operational frameworks. Experienced in leading cross-functional teams and mentoring junior engineers to deliver scalable AI solutions.

- **Programming**: Python, C++, R, MATLAB
- **Software Engineering**: Git, Docker
- **Databases**: PostgreSQL, Redcap
- **AI/ML Frameworks**: Scikit-learn, PyTorch, TensorFlow
- **Cloud Computing**: AWS, GCP

Selected Publications

- Vandewouw, M. M., Niroomand, K., **Bokadia, H.**, Lenz, S., Rapley, J., Arias, A., … Kushki, A. (2025). A precision health approach to medication management in neurodivergence: A model development and validation study using four international cohorts. *medRxiv*. https://www.medrxiv.org/content/10.1101/2025.03.12.25323683v1

- Hu, B. X., Yu, T., Tuinstra, T., Rezai, R., **Bokadia, H.**, DiMaio, R., … Tripp, B. P. (2024). Encoding medical ontologies with holographic reduced representations for transformers. *Fourth Workshop on Knowledge-Infused Learning*. https://openreview.net/forum?id=LN4zA2D8vd

- **Bokadia, H.**, Yang, S. C. H., Li, Z., Folke, T., & Shafto, P. (2022). Evaluating perceptual and semantic interpretability of saliency methods: A case study of melanoma. *Applied AI Letters, 3*(3), e77. https://doi.org/10.1002/ail2.77

- **Bokadia, H.**, Rai, R., & Torres, E. B. (2020). Digitized ADOS: Social interactions beyond the limits of the naked eye. *Journal of Personalized Medicine, 10*(4), 159. https://doi.org/10.3390/jpm10040159

- **Bokadia, H.**, Cole, J., & Torres, E. (2020). Neural connectivity evolution during adaptive learning with and without proprioception. *Proceedings of the 7th International Conference on Movement and Computing*, 1–4. https://doi.org/10.1145/3401956.3404232

Education

University of Texas- Austin, Texas, USA   **Sept. 2024 - Present**

Master of Science- Artificial Intelligence [GPA = 4.0/4.0]
Courses taken so far: Ethics in AI, AI in Healthcare (currently ongoing)

Projects: Multiple Generative AI/ LLM projects in Healthcare (ongoing)

Rutgers University- New Brunswick, NJ, USA   **2016 - 2018**

Master of Science- Industrial & Systems Engineering [GPA= 3.5/4.0]
Thesis: *Deep learning based virtual metrology for semiconductor manufacturing processes (in collaboration with Samsung Research, South Korea)*

Rajasthan Technical University, India   **2008 - 2012**

Bachelor of Technology- Mechanical Engineering [Grade= FIRST Division]

Work Experience

Holland Bloorview Kids Rehabilitation Hospital, Toronto, Canada   **Jan 2023 - Present**

Research Engineer-Data Science/AI (Full-time)

- Developed statistical analysis and machine learning methodologies to support clinical research projects at the Autism Research Centre, enabling data-driven insights for improved patient care.
- Designed and implemented an AI-based medication recommendation system to augment clinicians' decision-making processes, improving treatment precision and outcomes.
- Led database development and management on REDCap for the Province of Ontario Neurodevelopmental (POND) network, ensuring secure and scalable data pipelines for multi-site clinical trials.
- Utilized PostgreSQL to query large-scale datasets and provide actionable data exports across the POND network, enhancing research efficiency and collaboration.
- Conducted quality control, validation with case report forms, and database migration for multi-site clinical trials, ensuring data integrity and compliance with regulatory standards.
- Collaborated with multiple start-ups, research hospitals/labs, and non-profits in Ontario to drive interdisciplinary innovation in clinical research.

Mathworks x INCF, USA   **July 2023 - Sept. 2023**

Open source community toolbox internship (part-time/ remote)
- Modeled large-scale neuronal data recordings to simulate brain network dynamics using MATLAB.
- Analyzed 2-photon imaging data to extract biologically meaningful brain activity patterns.
- Enhanced open-source MATLAB toolboxes for neuroscience research, ensuring scalability and usability.

Medical AI group, University of Waterloo, Ontario, Canada   **May 2022 - Dec 2022**

AI Researcher (Full-time) in the Department of Systems Design Engineering
- Led a project on analyzing FHIR data using deep learning and generative AI in collaboration with a health-tech start-up.
- Developed a SNOMED-CT-based vector-symbolic language model combining symbolic computation and deep learning for healthcare applications.
- Worked with state-of-the-art transformer models to predict diseases using electronic health records (MIMIC-IV dataset), improving clinical decision-making and healthcare outcomes.

Montreal Institute for Learning Algorithms (MILA), Montreal, Canada   **July 2021 - Nov. 2021**

Intern - NeuroAI (remote)
- Conducted large-scale analysis of neural dynamics using generative modeling and deep learning techniques.
- Analyzed EEG data from healthy brain network (HBN) datasets with Python (MNE), uncovering patterns in neural activity.
- Applied Neural ODEs and dynamical systems modeling to simulate brain dynamics and predict complex neural behaviors.
- Leveraged GOKU-Net for advanced modeling of EEG data.

Cognitive and Data Science Lab, Rutgers University-Newark, NJ, USA   **Dec. 2020 - July 2021**

AI Researcher (Full-time) in the Department of Mathematics and Computer Science
- Developed PyTorch implementation of Probabilistic Linear Discriminant Analysis (PLDA) for medical imaging tasks.
- Applied Bayesian Teaching to combine cognitive science and machine learning, enhancing human decision-making with AI systems.
- Generated explanations for a VGG-16 model with attention modules for melanoma prediction on the ISIC dataset.
- Designed new metrics to evaluate interpretability of saliency methods, improving trust and usability in AI-driven medical imaging.

Rutgers University- New Brunswick, NJ, USA   **Sep. 2018 - Nov. 2020**

Researcher: AI/Neuroscience (Full-time) at Rutgers Centre for Cognitive Science in collaboration with Zeblok Computational (start-up company)
- Conducted Brain-Machine Interface research, developing neural correlates of disembodied cognition by controlling cursor movement with EEG data under varying kinesthetic feedback conditions.
- Designed digital biomarkers for Autism diagnosis by analyzing wearable biosensor data during ADOS tests, using network theory for connectivity analysis.
- Applied signal processing and statistical analysis to EEG and wearable biosensor data with MATLAB and EEGLAB, uncovering stochastic patterns in socio-motor dyads.

UltraTech, Aditya Birla Group, India   **Sep. 2012 - Apr. 2014**

Project Engineer (Full-time)
- Analyzed data from IoT sensors for Industry 4.0 projects, optimizing process monitoring and operational efficiency.
- Utilized control charts, statistical reliability analysis, and fault diagnosis to improve manufacturing workflows and reduce downtime.
- Conducted supply chain analytics to enhance resource utilization and production planning.
- Simulated production systems using Arena and Excel-VBA, identifying bottlenecks and evaluating process improvements.

Reviewer

- **IEEE Transactions on Industrial Informatics journal.**

BCI and Neurotechnology Spring School

g.tec   **April 2022 - May 2022**
- BCIs with EEG and other biosignals, neuromodulation, deep brain stimulation, gaming, brain assessment, closed loop experiments with TMS and tDCS, deep learning, communication, rehabilitation, functional mapping, programming, high altitude and sports medicine, neuromarketing, hacking and exoskeletons.