Ketan Suhaas Saichandran

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EDUCATION

Boston University — Boston, MA, USA
MS in Artificial Intelligence — **GPA: 3.96/4.00** — September 2023 — May 2025
Thesis track — Advisor: Dr. Vijaya B. Kolachalama

Indian Institute of Technology Roorkee — Roorkee, India
B.Tech in Electrical Engineering — **CGPA: 8.65/10.00** — July 2019 — May 2023

RESEARCH EXPERIENCE

Kolachalama Lab, Boston University — Boston, MA, United States
Research Scientist — June 2025 — Present

- Developed **collaborative multi-agent systems for scientific discovery** in Alzheimer's disease.
- Designed and developed a domain-specific **vision-language model** for neuropathology images based on Qwen2.5-VL.
- Implemented AFA on clinical **LLMs** to advance AI-augmented interactive medical diagnoses to assist physicians in real-time.
- Contributed to a large-scale **multimodal medical LLM** project by processing large-scale medical data and LLM post-training.

Graduate Researcher — September 2023 — May 2025

- Introduced a **state-of-the-art** active feature acquisition (AFA) framework, achieving **1-10%** performance improvement.
- Developed a novel non-greedy method for AFA by utilizing expected SARSA and CMI-based rewards, improving performance by **2-3%**.
- Designed a **zero-shot classification** framework for EEG channels and introduced a novel training strategy.
- Contributed to a large-scale **multimodal medical LLM** project by processing large-scale medical data and LLM post-training.

Deepti Research Group, Boston University — Boston, MA, United States
Research Collaborator — Sept 2024 — May 2025

- Introduced a novel method, **SCoPE**, to **enhance alignment** in **diffusion models** for complex prompts.
- Performed several experiments to prove the effectiveness of SCoPE against **stable-diffusion**, **improving on 83%** of samples.
- Inspired by human artistic processes, created a schedule for text conditioning to interpolate between coarse-to-fine prompt embeddings.
- Developed mathematical methods for scheduling the interpolation on the CLIP hypersphere.

Banaji Implicit Social Cognition Lab, Harvard University — Cambridge, MA, United States
Research Assistant — May 2024 — May 2025

- Discovered humanlike cognitive patterns in **LLMs** and explored cognition models to enhance **LLM humanlikeness**.
- Developed **automated pipelines** for **multi-turn batch-processing** on LLMs for research experiments.
- Founded SHASM (The Science of Human and Artificial Social Minds) as a researcher.

Machine Learning Lab, Electrical Engineering Department, IIT Roorkee — Roorkee, India
Undergraduate Researcher — August 2022 — May 2023

- Analyzed the nnU-Net architecture, validating its performance benchmarks for segmentation of cardiac MRI images.
- Assisted with the training and performance analysis of Attention-guided residual W-Net, which attained comparably high dice coefficient values, reaching 0.94.

PUBLICATIONS

1. **Saichandran, K. S.**, Thomas, X., Kaushik, P., & Ghadiyaram, D. (2025). Progressive prompt detailing for improved alignment in text-to-image generative models. *AI for Content Creation Workshop, Conference on Computer Vision and Pattern Recognition (CVPR)*. `https://arxiv.org/abs/2503.17794` (oral presentation)
2. Guney, O. B., **Saichandran, K. S.**, Elzokm, K., Zhang, Z., & Kolachalama, V. B. (2025). Active feature acquisition via explainability-driven ranking. *International Conference on Machine Learning (ICML)*. `https://icml.cc/virtual/2025/poster/45710`
3. Lehr, S. A., **Saichandran, K. S.**, Harmon-Jones, E., Vitali, N., & Banaji, M. R. (2025). Kernels of selfhood: GPT-4o shows humanlike patterns of cognitive dissonance moderated by free choice. *Proceedings of the National Academy of Sciences, USA*, *122*(20), e2501823122. `https://doi.org/10.1073/pnas.2501823122`
4. Lehr, S. A., **Saichandran, K. S.**, Harmon-Jones, E., Vitali, N., & Banaji, M. R. (2025). Reply to Cummins et al.: GPT reveals cognitive dissonance that is both irrational and alarmingly humanlike. *Proceedings of the National Academy of Sciences, USA*, *122*(20), e2501823122. `https://doi.org/10.1073/pnas.2518613122`
5. **Saichandran, K. S.**, Guney, O. B., Elzokm, K., & Kolachalama, V. B. (2025). Conditional mutual information-guided reinforcement learning for active feature acquisition. *IEEE Transactions on Artificial Intelligence* (under submission).
6. Singla, P., Singh, A., Garg, S., Garg, I., & **Saichandran, K. S.** (2025). Thinking About Thinking: Evaluating Reasoning in Post-Trained Language Models *AAAI* (under submission).
7. **Saichandran, K. S.** (2024). A Comparative Analysis of U-Net-based models for Segmentation of Cardiac MRI. *arXiv preprint*. `https://arxiv.org/abs/2401.09980`.

HONORS AND ACHIEVEMENTS

- **Optiver - Trading at the Close (Kaggle competition) - 2024**
  Received a bronze medal.
- **International Collegiate Programming Contest (ICPC) - 2022**
  Represented IIT Roorkee at Asia Regionals.
- **International Collegiate Programming Contest (ICPC) - 2021**
  Represented IIT Roorkee at Asia Regionals.
- **JEE ADVANCED 2019 (AIR 1640) – FIITJEE AWARD**
  Secured an All India Rank of 1640 out of more than 250,000 students selected from JEE MAIN, and received a cash prize of 100,000 INR.
- **JEE MAIN 2019 (AIR 1390)**
  Secured an All India Rank of 1390 out of more than 1,200,000 students.
- **KVPY Scholar-2019 (AIR 1237)**
  Secured an All India Rank of 1237 in the KVPY exam and admits from top research insititutions in India.
- **Indian National Physics Olympiad-2019**
  Cleared the NSEP exam and selected in the state top 10 and competed in the INPhO.

TALKS & PRESENTATIONS

ICML 2025 — Vancouver, Canada
Poster presentation — July 15th, 2025
AI4CC Workshop, CVPR 2025 — Nashville, TN
Oral & poster presentation — June 12th, 2025
GMCV Workshop, CVPR 2025 — Nashville, TN
Poster presentation — June 11th, 2025
Graduate School of Arts & Science, Boston University — Boston, MA
Thesis Defense — May 17th, 2025

TEACHING EXPERIENCE

Faculty of Computing & Data Sciences, Boston University — Boston, MA, United States
Teaching Assistant — DS 320: Algorithms for Data Science — January 2024 — April 2024

- Customized course curriculum aimed at enhancing students' competitive programming skills.
- Conducted discussions, facilitated office hours, assessed assignments, and helped with student questions online/offline.
- Designed and organized additional assignments and interactive sessions to support students.

INDUSTRY EXPERIENCE

Clairyon — CA, United States
AI Engineer — May 2025 — Present

- Built autonomous AI agents using Mastra and Model Context Protocol (**MCP**) servers and deployed on AWS at scale for hospitals.
- Developed **agentic AI** systems for automating clinical workflows, patient management and interacting with **FHIR** data.

NourishedRx — Stanford, CT, United States
AI Engineer Intern — May 2024 — August 2024

- Developed and deployed Generative AI applications to enhance user experience and internal efficiency, including automation workflows.
- Built and deployed AI solutions, such as *AskBetty*, an AI chatbot using AWS Bedrock and ReactJS on AWS Amplify, leveraging **RAG** for personalized health recommendations, and **LLM agents** to query BigQuery and Google FHIR, automating data retrieval and summarization.
- Designed and integrated APIs using AWS Lambda, and implemented pipelines to transcribe and summarize Amazon Connect call recordings via Amazon Transcribe and AWS Bedrock LLMs, streamlining documentation and patient note generation.

Slice — Bengaluru, Karnataka, India
Software Development Engineer Intern — May 2022 — July 2022

- Designed and optimized RESTful APIs in Java Spring Boot for Juspay payment integration, enabling high-throughput, low-latency transactions with endpoints for order creation, status retrieval, and payment authentication.
- Collaborated with front-end, DevOps, and security teams to enhance payment reliability, reducing transaction failures by 15% through improved error handling and retry logic.

UNIVERSITY EXPERIENCE

Outreach Cell, IIT Roorkee Roorkee, India
Member Oct 2020 — Oct 2021

- Volunteered within the Outreach Cell at IIT Roorkee, a student-led initiative operating under the purview of the Dean of Students' Welfare, IIT Roorkee. Assumed a pivotal role in facilitating connections between the external world and the distinctive culture and ethos of IIT Roorkee.

Esports IITR, IIT Roorkee Roorkee, India
Co-founder Dec 2020 — May 2023

- Co-founded a gaming group for students and organized university-level events that improved our visibility in the national-wide gaming communities.

Watch Out!, IIT Roorkee Roorkee, India
Multimedia Editor Oct 2020 — Oct 2021

- Shot, edited and designed multiple media releases, hosted several events on campus for our student media body at IITR.

PROJECTS

Zero-shot EEG classification September 2024 — Jan 2025
Kolachalama Lab, Boston University

- Developed a framework that can zero-shot classify with any new EEG channel during inference.
- Conceptualized that trained channel embeddings lie on a manifold resembling physical positions on the scalp.
- Introduced a training method by interpolating between channel embeddings for zero-shot inference with new EEG channels.

Gesture Controller February 2024 — April 2024
CS 585: Image and Video Computing

- Created a pioneering gesture-based video-game controller package for RPG, FPS, and Racing games.
- Optimized the code heavily to consider the movement of every landmark on the body and process the custom gestures.
- Designed gestures that sync with real movements - Walking on the spot, holding the steering wheel, striking and blocking.
- Developed a user-interface to map gestures to keys on the keyboard.

OPEN-SOURCE CONTRIBUTIONS

- **AWS Strands Agents** PR: Contributed to a major PR that introduces new functionalities to fetch and list the prompts from MCP servers.

TECHNICAL SKILLS

- **Programming Languages:** Python, C++, SQL, JavaScript, TypeScript
- **Tools/Software:** Anaconda, VS Code, Git, Docker, Terminal, WandB
- **AI Techniques:** QLoRA, CLIP, VLMs, RAG, RLHF, Quantization, LoRA, Attention, Agentic AI
- **Full-Stack Development:** ReactJS, NodeJS, Git, Docker, Gradio, Streamlit, AWS Bedrock, GCP Vertex AI, Lambda, Amplify, ReactJS, NodeJS, Spring Boot, Kubernetes, BigQuery, FHIR, AWS, GCP, Kubernetes
- **AI tech stack:** vLLM, Langchain, LlamaIndex, Pinecone, HuggingFace, MCP, unsloth, PyTorch, PyTorch Lightning, CUDA, TorchServe, Keras, TensorFlow, FastAI, Scikit-learn, OpenCV, Mastra