Hrithik Ravi

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EDUCATION

University of Michigan *Ann Arbor, MI*

B.S.E. in Computer Science and Engineering (Minor in Mathematics) *(Aug. 2019 – April 2023)*

M.S. in Elec. and Comp. Engineering (focus in Machine Learning, ***GPA: 4.0/4.0****)* *(Aug. 2023 – Dec. 2024)*

RESEARCH PUBLICATIONS

The Implicit Bias of Gradient Descent on Separable Multiclass Data

Hrithik Ravi, Clayton Scott, Daniel Soudry, Yutong Wang

NeurIPS 2024

WORK EXPERIENCE

Michigan AI Laboratory – Researcher *Ann Arbor, MI*

Advised by Clayton Scott, Rada Mihalcea, Ambuj Tewari *(Aug. 2023 – present)*

- Collaborated with professors to fill gaps in multiclass deep learning theory. Published findings at NeurIPS 2024 (first author).
- Researched inference-time steering approaches to debias OpenAI CLIP. Implemented linear probing and difference of means.
- Exploring limitations of frontier LLMs on synthetic reasoning tasks. Analyzing brittle generalization of SFT compared to ICL.

Google DeepMind – Open Source Developer *Remote*

Artificial Intelligence – Multimodal Michelangelo Benchmark *(May 2025)*

- Designed synthetic multimodal long-context eval. Proposal accepted to DeepMind Summer of Code (5% acceptance rate).

University of Michigan – Computer Science Graduate Student Instructor (TA) *Ann Arbor, MI*

EECS 281: Data Structures and Algorithms *(Aug. 2023 – Dec. 2024)*

- Received full tuition waiver to teach undergraduates foundations of data structures and algorithms.
- Held lectures, office hours to walk through example problems and to help students implement and debug C++ project solutions.

UofM Transportation Research Institute – Temp. ML Research Engineer *Ann Arbor, MI*

Computer Vision and Sensor Fusion – 3D Object Detection for Self-Driving Cars *(May 2023, June – Aug 2023: part-time)*

- Implemented a CV 3D IOU algorithm in OpenCV to evaluate accuracy, and safety of Detectron2 ML object detection model.
- Designed the algorithm to penalize false negatives harshly resulting in a model optimized for maximal passenger safety.
- Implemented a sensor fusion algorithm in MATLAB to provide a 360° view and enable safe path-planning in self-driving cars.
- Used Hungarian algorithm to fuse LIDAR and camera tracks, programmatically adding new tracks and discarding stale ones.

Amazon Web Services – Software Engineering Intern *Herndon, VA*

Security and Networking; Time-series Analysis for Predictive Managed Scaling *(June 2023 – Sept. 2023)*

- Built an iptables firewall with a token-bucket algorithm to fortify DNS servers against request floods, ensuring QoS for 3MN clients per region.
- Leveraged AWS Python API to implement an ML time-series pipeline in AWS Forecast, S3 to predict city-wide electricity consumption.

Amazon Web Services – Software Engineering Intern *Austin, TX*

Full-Stack Mobile and Web Development for Supply Chain Analytics *(May 2022 – Aug. 2022)*

- Mobile: Built notification UI in React Native, Typescript; backend in Expo, Firebase, Apple Notification Service, and NodeJS.
- Web: Developed interface to configure analytics, implementing frontend in React, backend in Kotlin and AWS DynamoDB.

Icuro Inc. – Machine Learning Intern *Santa Clara, CA*

Natural Language Processing (NLP) – Market Sentiment Analysis *(July 2021 – Sept. 2021)*

- Fine-tuned GPT-3 to analyze sentiment towards Amazon consumer product reviews in key aspects (“comfort”, “quality”, etc.).

AI, ML, AND CS PROJECTS

- **LLMs** - Built full LLM pipeline (data, large GPT model, self-supervised training, LoRA finetuning) in PyTorch. *March 2025*
- **AI** - Enhanced Sakana AI Scientist with RAG-based experiment reproduction from user-uploaded research papers. *Feb. 2025*
- **ML** - Trained CNN in PyTorch to extract goals from soccer footage, creating engaging highlight reels for viewers. *Aug. 2024*
- **Embedded Systems** - Built STM32 wireless gesture-controlled Glove “Hot or Cold” hidden object detection game. *Aug. 2022*

TECHNICAL SKILLS

ML Stack: Python, PyTorch, NumPy, Pandas, SQL, OpenCV, OpenAI API, Aider AI Agent, MATLAB, Matplotlib

Languages, Libraries, Toolkits: C, C++, JavaScript, TypeScript, Java, React, NodeJS, ARM, STM32, Linux, Bash