Ashwin R Bharadwaj

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Technical Skills

Languages: C++, Python, Java, GoLang, Typescript
Technologies: PyTorch, TensorFlow, ROS, React.js, Angular, Flask, Unity
Concepts: Artificial Intelligence, Machine Learning, Robotics, Operating System, Cloud Computing

Education

Northeastern University Expected May 2025
Master of Science in Artificial Intelligence (GPA: 3.75 / 4.00) *Boston, MA*

- **Teaching Assistant for Foundations of Artificial Intelligence for 4 semesters.**
- **Founder and the Leader of the Khoury Robotics Club.**

Work Experience

Cisco Systems Jan 2021 – Aug 2023
Software Engineer *Bangalore, India*

- Designed and implemented a backend frameworks in Golang, processing CRUD requests efficiently across 10000+ nodes and increasing throughput by 48% by minimizing internal routing.
- Developed an ML-based system to predict server load, integrated into ”Intersight” for automated scaling, improving power efficiency by 8.2%.

Microsoft Jan 2019 – Aug 2021
Research Intern *Bangalore, India*

- Created a machine learning model using graph structures to link historical images, sculptures, and textual descriptions of events. This was an effort to increase accessibility of local culture to boost tourism.
- Mentored interns to build a ReactJS-based web app for visualizing graph algorithms, utilizing GoLang and Python for internal workflows.

Major Graduate Projects

Environment Manipulation, Transformer (Master's Thesis)— *Pytorch, LLM, RL, Statistics, Transformers*

- Created a **RL + LLM** architecture that adapts seamlessly to diverse environments.
- Designed a **cross-attention Transformer** merging state and environment parameters to generate action tokens.
- Devised a specialized **loss function** minimizing drastic policy changes for minor environmental variations.
- Boosted **sample efficiency** by allowing single-environment experiences to generalize across multiple scenarios.
- **Outperformed standard RL baselines** in environment manipulation accuracy and adaptability.

FakeXplainer AI— *LLM, Flask, MongoDB, Docker, Kubernetes, Data Analysis, DevOps, PyTorch*

- Built as part of a **competitive hackathon** organized by the **Association for the Advancement of AI (AAAI)**, where it was chosen as the **winner**.
- Developed and deployed a **fully functional web application** in just **four days** that **generates and refines fake summaries** to assess **human susceptibility to misinformation**.
- Engineered a **dynamic system** that **tracks user interactions** and **adapts its output** based on **cognitive vulnerabilities**, leveraging **reinforcement learning (RL)** to enhance **text-to-voice persuasiveness**.
- Implemented an **active learning framework** that **fine-tuned the LLM**, successfully **convincing 78% of users** of at least **50% of the fabricated narratives** during testing on live participants.

Speedy Navigation of Indoor Environments with Limited Sensory Inputs— *PyTorch, CAD, ROS, Submitted to RSS 2025*

- Developed a **high-speed navigation algorithm** for closed indoor spaces using **minimal sensor data** (RGB, depth, and low-precision encoder readings).
- Modeled the environment as a **graph of 1x1 m nodes** updated in real time, enabling on-the-fly **mapping and localization** with **partial observations**.

- Leveraged **POMDPs** and **CNNs with tunable kernels** to robustly fuse multimodal data under uncertainty, achieving **accurate robot state estimation**.
- Attained a **92% success rate** in three distinct indoor environments, outperforming traditional SLAM in speed and collision avoidance post-mapping.
- Built a **cost-effective, universal mobile robot** with an emphasis on **rapid deployment** and **minimal collision risk**, demonstrating scalability and reliability.

Publications

Ashwin Bharadwaj, Anio Zhang, Rajagopla Venkat. *Shapeshifting Coloring Problems: An Interactive Tiling Assignment*. AAAI/EAAI 2025.(Awaiting publication)

A. R. Bharadwaj, Anio Zhang, "Efficient Inverse Kinematics for High-DoF Robots: A Kolmogorov-Arnold Network Approach", Northeast Robotics Colloquium (NERC), Amhrest, USA, 2024.

A. R. Bharadwaj, S. S. Chandra, D. S. Nair, A. R. Hatim and A. Ravikumar, "Automated mythological scene recognition using machine learning and graphs", 2020 International Conference on Artificial Intelligence and Signal Processing (AISP), Amaravati, India, 2020, pp. 1-5, Jan 2020.

Ashwin R. Bharadwaj, Hardik Gourisaria, Hrishikesh Viswanath, "Video Frame Rate Doubling Using Generative Adversarial Networks", Computer Communication, Networking and IoT (ICICC 2020), Bengaluru, India, Aug. 2020