

# Aryasomayajula Ram Bharadwaj

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## ABOUT

Versatile ML Engineer and Backend Developer with expertise in deep learning and strong DevOps knowledge. Skilled in multiple programming languages and refactoring legacy codebases, passionate about AI research.

## EDUCATION

### B.Tech Electronics and Communications

GMR Institute of Technology, Andhra Pradesh

2015 - 2019

## PROFESSIONAL EXPERIENCE

### Senior Developer at Innovation & Development Labs

Musigma Business Solutions, Bengaluru

2019 - Present

- Led development of multiple high-impact projects in LLM operationalization, automated trading, and MLOps.
- Specialized in backend development, DevOps, and ML engineering across various domains.
- Received multiple recognitions including Impact Awards and Star Performer of the Team.

### ML Alignment Theory Research Trainee

Stanford Existential Risk Initiative, Remote

May 2023 - July 2023

- Underwent training for research in AI alignment and Agency foundations under guidance of John Wentworth.

## KEY PROJECTS

### LLM Agent Platform

Team Lead, ML Engineer, Backend Developer

Dec 2023 - Present

- Designed and implemented a semi-autonomous data analysis platform powered by LLM Agents.
- Developed training strategies for LLM Agents via automatic prompt optimization and integrated Retrieval-Augmented Generation (RAG) support.
- Implemented evaluation for LLM Agent's results using ensemble of locally hosted LLMs.
- Maintained a customized fork of Microsoft's Autogen framework.
- Successfully deployed for two major clients, assisted client teams in creating usecases.

### Understanding Hidden Computations in Transformer Language Models

Independent Researcher

August 2024

- Conducted research to decode the "hidden" computations in transformer models during Chain of Thought (COT) reasoning.
- Investigated methods to enhance the faithfulness and internal mechanics of chain-of-thought reasoning in LLMs.

### Investigating the Platonic Representation Hypothesis

Independent Researcher

August 2024

- Evaluated representational convergence across in-distribution, out-of-distribution (ImageNet-O), and random noise data, finding the limits of where platonic representation hypothesis holds.
- Conducted noise injection experiments on Vision Transformer models, revealing non-linear alignment patterns as signal quality vs mutual alignment of the models.
- Tracked alignment across various training stages in large language models, identifying phases of representational similarity, suggesting convergence toward a shared structure at certain stages.

## Synthetic debate data generation

Feb 2024

*Individual Contributor*

- Implemented a LLM Agent system for generating debates using openai's gpt-4 model.
- Finetuned pythia and mistral models on the synthetically generated debates using LoRA and KTO methods
- Conducted experiments to understand emergence of deceptive behavior in LLM generated debates

## High Velocity Trading Platform

2021 - Dec 2023

*Team Lead, Backend Developer, DevOps*

- Refactored backend code and migrated deployment from bare-metal to Kubernetes.
- Implemented automated hyperparameter search for ARIMA models.
- Rewrote legacy trade-signal generation from R to Scala using Akka framework.
- Enabled near real-time metric calculation and portfolio visualization.

## Next-Gen Model Operationalization Platform

2019 - 2021

*Backend Developer*

- Developed automatic retraining pipelines for image classification models.
- Designed and implemented Java microservices for creating and serving Jupyter notebooks.
- Engineered a microservice for deploying ML models in a DAG structure with canary and blue-green deployment strategies.
- Created dashboards for monitoring model and resource usage metrics.

## Open Source Contributions

Ongoing

*Individual Contributor*

- Developed a framework for evaluating LLM-generated code in a sandboxed environment.
- Extended lm-eval-harness (LLM Evaluation framework) to support benchmarking of mathematical and arithmetic reasoning tasks.

# SKILLS

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<i>Languages</i>	Scala, Python, Java, R
<i>Deep learning Frameworks</i>	PyTorch (Expert level proficiency), JAX
<i>DevOps</i>	Kubernetes, Docker-swarm
<i>Frameworks</i>	Akka, Spring-boot
<i>AI/ML</i>	LLM Fine-tuning, Neural Network Architecture Implementation

# AWARDS & RECOGNITIONS

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## AI Alignment Awards

July 2023

[www.alignmentawards.com](http://www.alignmentawards.com)

Winning entry for the "goal misgeneralization" track research proposal, 5 out of 118 entries were selected in this research competition

## Honorable Mention

Mar 2022

*Alignment Research Center*

"Eliciting Latent Knowledge" is a open research problem in AI Safety, My proposal was one of the honorable mentions in the ELK (Eliciting Latent Knowledge) research competition.

## Impact Award

October 2022, December 2023

*Musigma Business Solutions*

Recognized for self-engagement, DevOps skills, and designing the LLM-Agent conversation platform.

**Star Performer of the Team**

2019 to 2023

*Musigma Business Solutions*

Received the SPOT award six times for exceptional contributions.

**Bronze Position**

Feb 2021

*Build-on-Redis Hackathon*

Winning entry in Build-on-redis hackathon, implemented a text2code search tool entirely on redis stack using codeBERT model's embeddings for a private coderepo