
EXPERIENCE

Samsung R&D Institute India - Bangalore (SRI-B)

Bengaluru, India

Lead Engineer, Machine Learning

Mar. 2023 - Aug. 2024

- Led the development of an **automated Python-based Android profiling tool** to benchmark rendering uniformly across devices, identifying bottlenecks (scroll janks) and enhancing rendering performance through improvements in the Android framework source.
- Led the development of four **edge-based personalization LLM solutions**, deriving actionable insights to enhance user experience
- Fine-tuned the **FLAN-T5 LLM model** for our specific use-case, optimizing performance & achieving a **~92%** evaluation score.
- Collaborated with engineers and testers to improve the quality of **~15k samples** for one of the said personalization solution.

Senior Software Engineer, Machine Learning

Mar. 2021 - Feb. 2023

- Designed an **edge ML solution** to analyze phone usage data and detect boredom with **~80% accuracy**, enhancing user experience. Built an Android app for **real-time inference with under 50ms latency**, showcasing the model's effectiveness.
- Pioneered a **Federated Learning (FL)**-based solution to predict gender and demographic age, **enhancing privacy** for **~10k users**. Explored innovative distributed learning techniques and tested diverse FL algorithms across 20+ input and model configurations, laying the groundwork for future privacy-preserving AI advancements.

Software Engineer, Machine Learning

Jun. 2019 - Feb. 2021

- Developed the Robot Camera Visualization Android app for **real-time visualization** of depth maps and 3D point-clouds from a ToF camera at **30 FPS**, with gesture-based UI features for enhanced user interaction, tailored to stakeholder requirements.
- Engineered a **privacy-preserving edge ML solution** for **Next App Recommendation**, published in **IEEE ICSC 2022**, by designing a memory-efficient model (**99% size reduction**) to minimize FL bandwidth costs. Trained and deployed the model in Java using **DL4J**, integrating it on Android edge devices with a User Trial (UT) app for **training and inference across 500+ devices**.

Hike Private Limited

New Delhi, India

Undergraduate Software Developer Intern

May 2017 - Jul. 2017

- Implemented **CNN** models in Python using **TensorFlow** for **image classification**, leveraging Google ML Engine APIs to accelerate training on Google Cloud. Deployed the model with **TensorFlow Serving** to expose REST APIs for generating model predictions.

EDUCATION

University of California, San Diego (UCSD)

*La Jolla, CA*Master of Science in Computer Science; GPA: **3.9 / 4.0***Sep. 2024 - Present*

Indian Institute of Technology, Kanpur (IIT Kanpur)

*Kanpur, India*Bachelor of Technology in Computer Science and Engineering; GPA: **9.0 / 10.0***Jul. 2015 - Jun. 2019*

PATENTS AND PUBLICATIONS

Methods and Electronic Devices for Behavior Detection using Federated Learning

*2023**US 18/191403*

- Novel methodology to identify new behavior trends across users and provide behavioral recommendations using Federated Learning

System and Method for Distributed Learning of Universal Vector Representations on Edge Devices

*2023**US 17/946349*

- Novel framework for learning user behavior embeddings directly on edge devices using Federated Learning

Memory Efficient Federated Recommendation Model

*2022**IEEE 16th International Conference on Semantic Computing (ICSC)*

- Proposed novel model framework for Federated Learning-based recommendation systems which uses a fixed size encoding scheme for items and users, thus not affected by the number of items/users, hence memory efficient and well suited for large-scale applications

RELEVANT PROJECTS

Multi-task Learning with ToolkenGPT Framework | Course Project, UCSD

Sept. 2024 - Dec. 2024

- Re-implemented ToolkenGPT framework, optimizing for computational efficiency and adapting it to smaller models like Llama-3.2 1B
- Led experimental research on multi-task capabilities, evaluating joint-task performance across different computational tasks

AWARDS AND ACHIEVEMENTS

Samsung Excellence Award | SRI-B

2024

- Recognized as **Star of the Quarter** for excellent contributions in projects

Key Talent Recognition Program Award | SRI-B

2023

- **Globally recognized** for exemplary teamwork and significant contributions to projects and organizational goals

TECHNICAL SKILLS

Programming Languages: Python, C/C++, Java, Kotlin, SQL, Golang, Shell Script (Bash)**Frameworks, Libraries & Misc.:** TensorFlow, PyTorch, Pandas, Scikit-learn, GitHub, DeepLearning4Java (DL4j), Linux