Sathvik Karatattu Padmanabha

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Education

MS, Computer Science, *Georgia Institute of Technology* | Atlanta, USA
4.0 GPA Graduate Teaching Assistant (GTA) for the course Advanced Internet Systems and Application Development *2024 - 2026**
Relevant Coursework : Graduate Algorithms, Machine Learning, Big Data Systems, Deep Learning

9.75/10 **BE, Computer Science and Engineering**, *M S Ramaiah Institute of Technology* | Bangalore, India *2017 - 2021*

Skills

Programming C, C++, Python, Java, Scripting (Bash and csh), SQL, PL/SQL
Software Git, Docker, Kubernetes, Linux (Ubuntu and Oracle Linux), Pytorch, Tensorflow, Keras, ELK stack
Domains Data Structures & Algorithms, Machine Learning, Operating Systems, Database Systems, Big Data Systems, LLMs
Soft Skills Self-Motivated, Team Player, Quick Learner, Strong Written and Verbal Communication, Adaptive, Versatile

Experience

Oracle, *Associate Software Engineer* | Bangalore *Aug 2021 – July 2024*
- Worked on projects in the domain of Monetization (OMS-BRM). Technologies used include C, C++, Java, OCI, Docker, Kubernetes.
- Reduced 50% fortify vulnerabilities in the codebase by replacing sprintf with a safer alternative.
- Developed APIs in C and C++ for management of Automatic Subscription Sharing Groups (99% process efficiency improvement)
- Created a multi-threaded application in C that parallelly deletes huge number of unused database objects (90% faster deletion)
- Enhanced existing Notification framework using C, Java and Kafka for automated notifications. (70% performance improvement)
- Mentored juniors on secure coding standards. Also fixed security, internal and customer issues in the product.

Micro Focus, *Intern* | Bangalore *April 2021 – Aug 2021*
- Integrated Dashboard component of Novell Access Manager(NAM) with another product called SAPIM via a plugin (80% faster logic).
- Enhanced the monitoring component for compatibility across products. Technologies used include Bash Shell, Python, ELK stack.

Samsung Research Institute Bangalore, *Samsung PRISM Researcher* | Bangalore *Jan 2020 - Nov 2020*
- Research Project on reducing complexity of Video Super Resolution using Dynamic Upsampling Filters.
- Performed experiments on various image processing networks such as GANs and RDNs using Tensorflow, Keras and OpenCV.
- Reduced the number of computations of a SOTA algorithm on VSR-DUF by 54%. Progressed to the final round of PRISM competition.

Research Publications

Speech Recognition for Kannada using LSTM (Deep Learning) *Sept 2022*
International Conference on Advances and Applications of Artificial Intelligence and Machine Learning 2022 URL
- An ASR system for Kannada language was developed using LSTMs. Technologies used include Kaldi, bash and python.
- Analyzed effects of batch size, hidden layer dimension, and number of LSTM layers on WER. Accuracy of 97% achieved
- Developed a new pre-processing method to achieve efficient transliteration of special characters and nasal sounds.

Understanding Federated Learning And Its Application In Video Anomaly Detection *June 2022*
International Journal of Engineering Applied Sciences and Technology, 2022 URL
- Applied federated approach to train a video anomaly detection model. Technologies used include Flower framework, Python.
- Conducted experiments to analyze feasibility based on bandwidth, latency, CPU usage etc on both image and video data sets
- Improved accuracy by 2% when compared with the baseline model while maintaining privacy aspect of Federated learning

Projects

ScaleFL Visualization | *Research Project on Federated Learning, *Ongoing* *Aug 2024 - Dec 2024*
- Modified the existing ScaleFL source code to generate comprehensive visualization reports for comparisons on model architectures, summaries, execution times and model parameters for various clients in a resource-adaptive Federated Learning setup
- Modified existing code to allow the user to input well-defined client-level complexities per level instead of a heuristic determination
- Gained knowledge on early exit classifiers and parameter scaling. Technologies used : python, pytorch, matplotlib

Critical Event Anomaly Detection | *Machine Learning, Computer Vision* *Oct 2024 - Dec 2024*
- Developed a video anomaly detection system for car dash cam footage using a combination of unsupervised and supervised learning.
- Numerous technologies and python libraries used including keras and tensorflow. ML algorithms included KMeans, GMMs, AutoEncoders and Multivariate Gaussians. Achieved an F1 score of 0.8 with very limited training.

Fine tuning LLMs for Language Translation and Medical Diagnosis | *Big Data Systems, LLMs* *Oct 2024 - Dec 2024*
- Fine tuned Facebook mbart and Google mt5 models for translation between English and Hindi languages.
- Numerous technologies and python libraries used including transformers, pytorch, nltk. Increased BERTScore by 5%.
- Translation followed by Medical diagnosis using fine tuned Mistral and Llama models. Improved differential accuracy by over 20%.

Simple Full Stack Web applications | *Undergraduate College course projects* *2019 - 2020*
- Timetable Generator app - Designed logic for generating college timetables. Technologies used include python and flask.
- Book Store app - Developed a web app using springboot that tracks books purchased and issues notification events.
- Workshop Organization app - Developed a MEAN app that registers and tracks workshops across different locations.

Certifications

- Algorithms & Software Development: *Mastering DS and Algorithms using C & C++* (Udemy), *Learning the Elastic Stack* (Linkedin)
- Cloud & DevOps: *Introduction to dockers* (Micro Focus), *Certifications on Java, OCI and Kubernetes* (Oracle)
- Machine Learning & AI: *Supervised Machine Learning: Regression and Classification* (DeepLearning.AI), *Fundamentals of Deep Learning for Computer Vision* (Nvidia Deep Learning Institute)