

Bharani Ujjaini Kempaiah

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EDUCATION

Carnegie Mellon University – School of Computer Science

Master of Computational Data Science | QPA: 4.12/4.33

Selected Coursework: Cloud Computing, ML with Large Datasets, Multilingual NLP

Pittsburgh, PA

December 2022

PES University

Bachelor of Technology in Computer Science & Engineering | GPA: 9.83/10

Bangalore, India

May 2021

SKILLS

Programming Languages: Python, C, Java, R, SQL, Scala

Frameworks and Tools: Docker, Kubernetes, Hadoop, Spark, Kafka, TensorFlow, ESPnet, Fairseq, Terraform, Helm

Web Frameworks: Flask, Vertx, Spring Boot

Cloud Platforms: AWS, Microsoft Azure, GCP

Databases: MySQL, HBase, MongoDB, Neo4j

EXPERIENCE

AppDynamics, Cisco Systems (India) Private Limited

Technical Undergraduate Intern

Bangalore, India | Remote

January – May 2021

- Developed Component Tests for OpenTelemetry supported agent using JUnit
- Created library to dynamically alter agent configurations. Written in Java, it uses SnakeYAML to construct custom Java objects and is currently being utilized by the OpenTelemetry team to test future builds of agent
- Collaborated closely with software development team to identify testing requirements and aided in resolving bugs

Centre for Cloud Computing and Big Data, PES University

Research Intern

Bangalore, India

June 2019 – December 2020

- Examined DeathStarBench and TeaStore microservices to identify performance bottlenecks responsible for reduced efficiency of microservices based applications
- Monitored utilization of system resources and investigated performance sensitivity of operating system parameters using Docker Stats, perf, mpStat and TShark
- Formulated a placement algorithm to map containers of a microservice to cores of server hardware and devised a mechanism to coalesce services on commonly called paths into a single container, achieving up to 26% improvement in latency and 29.5% in throughput

PROJECTS

Iterative Back-Translation-Style Data Augmentation for Low Resource ASR and TTS

Carnegie Mellon University | January 2022

- Adapted back-translation style data augmentation technique to speech processing by leveraging ASR and TTS outputs to improve each other's performance iteratively
- Implemented a conformer-based ASR model with linear fusion of HuBERT and spectrum-based features. TTS model was a combination of Glow-TTS and HiFi-GAN
- Successfully merged ASR recipe into the espnet open-source toolkit
- Achieved up to 6.91% and 10.87% reduction in word error rate (WER) and character error rate (CER) respectively for ASR and 2.91% improvement in Mel cepstral distortion (MCD) for TTS model

Twitter User Recommendation

Carnegie Mellon University | August 2021

- Worked in a team of 3 to build an application for recommending similar Twitter users
- Designed an efficient and fault-tolerant web tier consisting of 3 microservices using Amazon EKS with managed node groups to handle high loads (~tens of thousands of RPS) under a constrained budget
- Performed ETL on a large Twitter data set (~1 TB) using Apache Spark on the Azure Databricks platform and deployed storage tier on an AWS RDS MySQL instance
- Automated service deployment using eksctl, Terraform and helm charts
- Ranked 5th in terms of performance/cost ratio in a live test spanning ~3 hrs

PUBLICATIONS

Kempaiah, Bharani Ujjaini, et al. "A Deep Learning Approach for Speed Bump and Pothole Detection Using Sensor Data." *Emerging Research in Computing, Information, Communication and Applications*. Springer, Singapore, 2022. 73-85.

Rao, Vishal, et al. "Scheduling Microservice Containers on Large Core Machines Through Placement and Coalescing." *Workshop on Job Scheduling Strategies for Parallel Processing*. Springer, Cham, 2021.

Goutham, K. S., et al. "Performance sensitivity of Operating System parameters in Microservice environments." *2020 IEEE International Conference on Cloud Computing in Emerging Markets (CCEM)*. IEEE, 2020.