SHYAM SUNDAR NAMBIRAJA

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EDUCATION

ARIZONA STATE UNIVERSITY *Tempe, AZ*
Master of Science in Computer Science *August 2022 – May 2024*
Courses: Combinatorial Optimization, Planning and Learning methods in AI, Topics in Reinforcement learning, NLP

GREAT LEARNING, GREAT LAKES INSTITUTE OF MANAGEMENT *Tamil Nadu, India*
PGP Data Science and Engineering *March 2019 – October 2019*

COLLEGE OF ENGINEERING GUINDY, ANNA UNIVERSITY *Tamil Nadu, India*
Bachelor of Engineering in Electronics and Communication Engineering *Aug 2012 – May 2016*

RESEARCH EXPERIENCE

Graduate Research Assistant | Arizona State University *May 2023 – May 2024*
- **Scaling Bayesian Optimization -** Existing BO approaches do not scale to High dimensions rendering them unsuitable for many real world applications. My research culminated into a Thesis titled *Multi Agent Rollout for Bayesian Optimization* under the supervision of **Prof. Giulia Pedrielli** which was published to the *Winter Simulation Conference, 2024*

WORK EXPERIENCE

Machine Learning Software Engineer | E-con systems *Jan 2020 – June 2022*
- Pivotal in the development of a Biometric application utilising **Face recognition** involving the entire ML life cycle from finalising model architecture to optimization (**pruning , quantization**) and deployment on **Jetson devices**.
- Augmented people detection and tracking pipeline of vTrack with accelerometer data and architected a custom lightweight model inspired by SOTA **object detection** models thereby increasing the accuracy by 2%
- Spearheaded the **video analytics pipeline** to optimize offline retail store operations that enhance user-product engagement and operational efficiency and rendered an interactive dashboard of the inferences.
- Responsible for the development of a custom CNN architecture inspired by **Depthwise Conv** and **Attention mechanisms** to differentiate between staff and non-staff based on information that exists in 20% of the pixels.
- **Dynamic A/B testing** of Ads through **bandit strategy** thereby reducing the regret of displaying a less engaging Ad by almost 90%. Further statistical testing using demographic data and eye gaze obtained from smart Digital Signage to identify KPIs that are of interest to potential advertisers. Resulted in a 20% increase in lead generation.
- Architected a standard **Data management pipeline** using role based access control for seamless data access to standardise ML operations across a team of 5 members thereby reducing the man hours and improved process efficiency.

Associate Software Developer | Billion Tags *July 2016 – October 2018*
- Identified queries taking longer time and implemented various **sequel optimization** techniques thereby reducing the client-side rendering load time by 50%
- Implemented **thread level persistence injection** for faster data access on multilevel databases.
- Revamped application suitable for client-side rendering using ReactJs thereby isolating server-side components and reducing load times by 23 %

PROJECTS

- **Multi Agent Bayesian Optimization -** Optimization in High dimensional search spaces is challenging. Distributed optimization using multiple agents improve the quality of sampling and enhance the performance.↗
- **Symbolic Deep Reinforcement Learning -** SDRL framework is a way to incorporate symbolic planning so as to aid the hierarchical decision making and focus on meaningful exploration of agent in long horizon sparse reward Atari game Montezuma's Revenge ↗
- **Multi-echelon Inventory Optimization -** Optimizing the inventory cost of a simple supply chain environment involving multiple stakeholders using an Actor-Critic policy gradient algorithm.
- **Transformer Augmentations -** LLMs like GPT suffer from the inverse scaling problem which makes them vulnerable to memorization trap, logical fallacies. Architectural modifications are done and experimented with benchmark datasets.

SKILLS

Languages	: Python, SQL, Java
ETL tools	: Kafka, AirFlow, Airbyte, dbt, BigQuery, PostgreSQL, MySQL, MongoDB, S3
Frameworks	: TensorFlow, Pytorch, Dask, HuggingFace, OpenCV, TensorRT, OpenVINO, CUDA, TFlite
Tools and OS	: SLURM, Ubuntu Linux, Gitlab, Git, JIRA, AWS EC2, Sagemaker, Jupyter, MLFlow, DVC, Tableau
Miscellaneous	: Linear Programming, Data Structures, Machine Learning, Computer vision, Image Processing, Transformers