VAIBHAV MATHUR

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EDUCATION

New York University   **Jan 2021 - Present**
Master of Science: Computer Engineering, GPA: 3.8/4

Netaji Subhas Institute of Technology   **June 2013 - Apr 2017**
Bachelor of Engineering: Information Technology

EXPERIENCE

Graduate Research Assistant, **NYU CILVR Lab,** New York, NY   **June 2021 – Present**
- Exploring Reinforcement Learning (RL) and Self Supervised Learning (SSL) methods for Robot Learning under Prof. Lerrel Pinto.
- Developed a novel Inverse RL method called Regularised Optimal Transport that adaptively combines an Imitation Learning prior with RL exploration capable of learning many robotics tasks using a single expert demo with a 7.8x speedup to reach a 90% success rate over existing baselines.
- Created a framework for Vision based learning using RL, sim2real and Domain Randomisation methods to adapt a policy trained in Simulation to the real world to complete tasks such as Pick and Place and PegInsertion.

Software Development Engineer, **Zomato,** Gurgaon, India   **Feb. 2019 – Nov. 2020**
- Built Zomato's in-house Distributed and Highly Scalable Monitoring and Alerting Platform. The platform reduced incident response time by 80% and allowed for Preemptive Incident Detection and Alerting.
- Created the Dynamic Inter-service Discovery and Communication for microservices using Envoy and a Golang microservice for AWS ECS Container discovery enabling migration to a microservice-based architecture.
- Set up Zomato's Distributed Relational Database. It distributed query load and reduced query failure rates by 87%.

Software Engineer, **Hong Kong Shanghai Bank (HSBC),** Pune, India   **Sept. 2017 – Feb. 2019**
- Led team's service migration to HSBC's Internal Cloud Platform.
- Created the Microservice Deployment Service acting as an internal CICD tool in Spring Boot. Reduced service deployment incidents by 53% and decreased the service deployment time to <1 min.

PROJECTS

Collab-Editor (code)
- Developed a browser-based Collaborative Simple Text Editor.
- Implemented it using Replicated Growable Array, a type of Conflict-Free Replicated Data Type (CRDT) to achieve eventual consistency even if the user is not connected to the internet.

Distributed Training (code)
- Created a Distributed Training Pipeline for learning Self-Supervised embeddings for various downstream tasks from images using Pytorch Distributed Data-Parallel.

MARL (code)
- Implemented Multi-Agent Reinforcement Learning (MARL) using 2 Independent DQNs with information sharing to master the game of Knights Archers Zombies.

Hydra (code) (paper)
- A P2P platform to generate, share, contribute to ML Datasets and train Deep Learning models.
- Implemented a Distributed Hash Table for Node Discovery, Multi-tracker approach using Raft to create a fault-tolerant archive of datasets. Used All-Reduce to run Synchronous Stochastic Gradient Descent for distributed training.

SKILLS

- **Languages:** Python, C/C++, Golang, Java, NodeJS, PHP
- **Frameworks:** Pytorch, Tensorflow, SpringBoot, Django, Flask, Open MPI, Express.js, Platform.io
- **Technologies and Tooling:** AWS, Kafka, Kubernetes, ElasticSearch, Redis, Zookeeper, MongoDB, Cassandra, Mujoco Simulation, Terraform, Ansible, Packer, Linux, ROS, Prometheus, Packer

Publication and Achievements

- Watch and Match: Supercharging Imitation with Regularized Optimal Transport (CoRL 2022, RSS poster)
- Assessing the Effects of Social Familiarity and Stance Similarity in Interaction Dynamics (Published in Springer Complex Networks 2017)
- Recognition award for my notable contribution to the cloud migration project at HSBC.
- 1st prize in HSBC Codegrid Hackathon: Created a Live Meeting Transcript Generator for Cisco WebEx meetings.