Pratiksha Pai

in pratiksha-pai   ⚇ pratiksha-pai   ✉ pratikshapai77@gmail.com   ☐ +1-470-929-4863

EDUCATION

Masters Electrical and Computer Engineering *(Computer Systems and Software)*	CGPA: 3.93/4.0
Georgia Institute of Technology, Atlanta, GA	Aug 2022 - Present
Bachelors Electrical Engineering *(Minor in Computer Engineering)*	CGPA: 9.03/10.0
NIT, Karnataka, India	Aug 2015 - May 2019

EXPERIENCE

Mathworks *Natick, US*
Engineering Development Group Intern *June 2023 - August 2023*

Cloud Install Manager - Development & Automation | Go, Docker, Perforce
- Led multi-team effort to develop Cloud Install Manager, automating workflows, cutting setup from 2+ hours to 30s.
- Implemented a parallel execution engine for 17+ packages with Go's concurrency, reducing build time by 70%.
- Engineered 10+ dynamic configuration utilities slashing configuration time from 3 hours to a click.

Georgia Institute of Technology *Atlanta, US*
Graduate Research Assistant *Jan 2023 - Present*

Advanced Real-Time Human Motion Tracking | CV2, Mediapipe, Deeplabcut, OpenBCI
- Fine-tuned & open-sourced DeepLabCut Efficienet with 1500+ frames, adapting to human motion tracking from animals
- Boosted video capture rate from 120 to 1000+ FPS at WUXGA, via a modular, multi-threaded system.
- Created a toolkit with CV2, Google MediaPipe, enabling real-time behavioral analytics, higher-dimensional mappings
- Integrated OpenBCI with the toolkit to integrate multi-modal sensory data analytics.

Infoworks.io *Bangalore, India*
Senior Software Engineer *Jan 2021 - July 2022*
*Received the **Be The CEO award for 2021** among **100+ developers** for exceptional ownership skills.*
*Received yearly **Spot awards 2019 & 2020** for developing key features, excellent teamwork.*

Horizontal Pod Autoscaling for MongoDB on Kubernetes | Kubernetes, GCR, MongoDB, Bash, Git Actions
- Led Kubernetes containerization for MongoDB and 5 core services, cutting system startup latency from 90s to 4s.
- Automated MongoDB's transition to a resilient 3 node replicaset, interfacing with the 4+ core services in production
- Attained a max failover time of 4s and replication latency of 0.47s, enhancing database reliability in production.
- Utilized Github actions, Helm, GCR for a standardized and efficient deployment process used by 4+ teams.

Automated Product Upgrades | Python Taskflow Graph, Linux, Mongo
- Implemented cross platform end-to-end install/upgrades for 9+ services and data components used on 1000+ customer environments through multi-threaded Taskflow Engines.
- Led the production migration of 2.6M MongoDB metadata documents using Python Taskflows.
- Wrote a 200GB MongoDB Atlas transition, with 30+ system critical checks for data validity.

Infoworks.io *Bangalore, India*
Software Engineer *June 2019 - Dec 2020*

Cloud Automation & Optimization | Jenkins, Infra tools, Airflow
- Wrote Jenkins pipelines using Terraform, Ansible, cutting build times to 30 minutes & enabling weekly updates.
- Wrote AMI-based backup and monitoring via CloudWatch, Lambda, Prometheus for production systems
- Authored auto-shutdown scripts for AWS, Azure, and GCP, delivering a cross-platform 35% cost reduction.
- Designed Apache Airflow test suites, uncovering 20+ system-critical and 120+ routine bugs in the MVP.

ACADEMIC PROJECTS

Georgia Institute of Technology *Atlanta, US*
Course Projects *Aug 2022 - Present*

Blockchain Transaction Optimization | Python, Web3, Solidity | April'23
- Crafted a Python toolkit with Web3 and Solidity, automating 500+ transactions for academic blockchain currency.
- Engineered nonce-finding, hash validation, dynamic pricing algorithms, enabling effective search through 15,000 nonces

WiFi Network Security Analysis | Scapy, Wireshark, VirusTotal | March'23
- Conducted threat analysis of campus WiFi used by 2K+ people using bare-metal pcap dump.
- Identified 2 threats using domain reputation, IP-to-domain resolution for threat categorization, using VirusTotal API.
High-Performance Computing: Parallel Quicksort & Jacobi | C++, OpenMPI, Python | April'23

- Achieved 4x speedup in quicksort and Jacobi iteration via parallel algorithms and MPI in C++
- Wrote efficient data partitioning techniques that reduced & storage complexity by an order of magnitude of $O(n)$.

Network Simulation & IoT Modeling | C++, NS3, Python | April'23
- Modified NS3 scripts to simulate diverse network and rate-adaptive WiFi controls, benchmarking network efficiency.
- Crafted high-radius IoT network simulation using NS3 and LoRaWAN, assessing performance.

Advanced Computing | OpenMP, OpenMPI, CUDA, SFML | Nov'22
- Parallelized independent operations in 2D heat distribution & matrix multiplication in CUDA, OpenMP, and OpenMPI.
- Wrote a C++ TCP client-server system using sockets, capable of supporting & logging 10+ servers and 20+ clients.

Paraphrasing using BERT | Python, HuggingFace | Nov'22
- Introduced three novel architectures—Lin-CS, NonLin, Concat— on pretrained BERT model for early sentence interaction in paraphrase detection, finding linear layers + fixed cosine-similarity to be optimal.
- Trained & validated the models on MRPC and TAPACO datasets, balancing the corpus to mitigate bias & overfitting.

Unpaired image-to-image translation using CycleGAN | Pytorch, Tensorflow | April '19
- Developed a CycleGAN in PyTorch to transform horse-to-zebra images using the UC Berkeley dataset.
- Implemented dropout layers and conducted hyperparameter tuning to optimize the model's performance.

Technical Skills

- **Languages**: Bash, C++, Go, JSON, Python, Solidity, Web3
- **Tools**: AWS CloudWatch, Ansible, Apache Airflow, DeepLabCut, Docker, GCR, Git, Jenkins, Kubernetes, Lambda, MediaPipe, MongoDB, Packer, Prometheus, PyTorch, Terraform
- **Frameworks**: CUDA, MPI, OpenMP, SFML
- **Relevant Courses**: Adv. Programming Tech, High Perf. Computing, Computer Networks, Computer Vision, Generative DL, Neural Networks, Stat ML