Pratiksha Pai

in pratiksha-pai   **◯** pratiksha-pai   **✉** pratikshapai77@gmail.com   **▢** +1-470-929-4863

ABOUT ME

- I'm a 2nd year Master's **Computer Engineering** student at Georgia Institute of Technology.   *(Aug'22-Present)*

- I'm working as **Graduate Research Assistant** at Neuroloops lab with Prof. Celikel Tansu.   *(Aug'22-Present)*

- Recently, I interned as a **Engineering Development Intern** at Mathworks, Natick, US.   *(June'23-Aug'23)*

- Previously, I was a **Senior Software Engineer** *(Jan'21-July'22)* and **Software Engineer** *(June'19-Dec'20)* at Infoworks.io, Bangalore, India.   *(June'19-July'22)*

EDUCATION

Masters Electrical and Computer Engineering *(Computer Systems and Software)* — CGPA: 4.0/4.0
Georgia Institute of Technology, Atlanta, GA — Aug 2022 - Present

Bachelors Electrical Engineering *(Minor in Computer Engineering)* — CGPA: 4.0/4.0
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, DevOps, Agile
  - Led multi-team effort for Cloud Install Manager, automating workflows, cutting setup time from **3+ hours to 90s**.
  - Implemented a parallel execution engine for **17+ packages** with Go's concurrency, reducing build time by **70%**.
  - Wrote **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*

  Open-Source Real-Time Human Motion Tracking Dataset | CV2, Deeplabcut | **Dataset** | **Github**
  - Collected **100+ videos, 5000+ frames** of images for closed loop tasks, via a modular, multi-threaded system.
  - Open-sourced custom labeled dataset to adapt **DeepLabCut** a markerless pose estimator
  - Fine-tuned DeepLabCut for real-time human motion tracking, beyond its initial animal tracking use.

  Open-Source Sensorimotor Kit | CV2, Mediapipe, OpenBCI, PyQt5 | **Github**
  - Designed and open-sourced the Sensorimotor Kit, enabling recording and analysis of diverse sensory inputs.
  - Enhanced video capture to **120+ FPS** for **WUXGA** frames with a modular multi-threaded system.
  - Integrated EEG, EMG, and hand tracking into the kit for **real-time** behavioral tracking and analytics.
  - Integrated GUI components with PyQt5 providing easy-to-use interface for academic experiments

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

  Horizontal Pod Autoscaling for MongoDB | Kubernetes, Helm, GCR, MongoDB, Bash, Git Actions, ArgoCD
  - Led Kubernetes containerization for MongoDB including configuration, seed & setup, deploy & tests.
  - Implemented & performance tested MongoDB's transition to replicaset loadbalancer from standlone, in production.
  - Interfaced MongoDB Replicaset with the **4+ core** services, with max failover of **4s**, replication latency of **0.47s**.
  - Utilized Github actions, Helm, GCR, ArgoCD for a standardized and efficient deployment process.

  Python Framework for installater | Python, Taskflow Graph, Linux, Mongo, Mongo Atlas
  - Implemented automated end-to-end Python taskflow framework to configure, run the installer and rollback tasks.
  - Wrote **15+** functions to perform prereq check, setup & index metastore, seed data, handle configuration, cleanup, etc.
  - Developed the testing framework for **3+ major versions** according to customer specifications.

  Python Framework for upgrades | Python, Taskflow Graph, Linux, Bash, Mongo, Mongo Atlas
  - Led & tested Python Taskflow framework for end-to-end upgrades on customer environments.
  - Orchestrated automated migration & verification of critical **2.6 million** MongoDB metadata documents in **production**.
  - Wrote a **200+ GB** MongoDB local to Atlas transition framework, scripted **30+** system critical checks for data integrity.

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

  Cloud Automation & Optimization | Jenkins, Cloud Infrastructure Tools, AWS/Azure/GCP CLIs, Airflow
  - Wrote Jenkins & Drone CI/CD pipelines using configuration management tools like Terraform, Ansible, cutting build times to 30 minutes & enabling weekly updates.
  - Wrote AWS AMI-based backup and monitoring via CloudWatch, Lambda, Prometheus for production systems
  - Authored auto-shutdown scripts for AWS EC2, 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.

  Monitoring and Alerting Infrastructure | Prometheus, Grafana, Lambda, Slack, AWS
  - Engineered monitoring systems via Prometheus and Grafana, overseeing 10+ nodes to ensure timely Slack alerts.
  - Established Lambda functions for server memory and disk space checks and automating AMI snapshot creation.
  - Authored detailed on-call playbooks for multi-timezone incident management, detailing precise resolution steps.

  Automation Initiatives | Github Actions, AWS, Azure, Databricks CLIs, Terraform, Jenkins
  - Automated machine deployment with product versions for developers through Jenkins, AWS, Azure CLIs, Terraform, and Databricks CLI.
  - Automated release branching, adhering to the development cycle and branch tagging.
  - Automated artifact building for every GitHub commit, facilitating rapid testing and deployment.

HACKATHONS

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

  Chrome extension for website interaction | JavaScript, Claudev1 API, HTML, CSS | **GitHub** | **Demo** | **Devpost**
  - Built a chrome extension to scrape a website and get relevant information using Claude API
  - Implemented highlighting feature on the website for easy reading, chat feature for interaction
  - Enabled seamless browsing through SEO optimized websites, foreign language, scientific websites, etc.

  Personalised journaling iOS app | Swift, Langchain, Firebase, Flask, Heroku, Python | **GitHub** | **Demo** | **Devpost**
  - Implemented a personalized prompt system using Langchain & Heroku, adapting to user's previous journal entries.
  - Integrated social features to add friends, maintain streaks, and send stickers for user engagement.
  - Utilized Firebase Auth and Database for robust user authentication and data storage.

ACADEMIC PROJECTS

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

  Finetuning LLaMA2 on Python Code Dataset | Pytorch, Hugging Face | **GitHub**
  - Finetuned LLaMA 2 7 Billion parameter model on Python instruction dataset
  - Implemented QLoRA for parameter efficient finetuning to work on a single 32GB NVIDIA A100.
  - Enabled local interfacing of finetuned model through Hugging Face

  Implementing Generative AI models for MNIST dataset | Pytorch, Scipy, Numpy, Pandas | **GitHub**
  - Implemented autoregressive models like NADE, MADE, NICE, VAE for generating MNIST data
  - Tested models like EM, GAN, EBMs, Score base diffusion models for generating MNIST data
  - Performed an in-depth comparison of these models focusing on efficiency, accuracy, and quality of outputs

  Models evaluating sentence similarity among paraphrases using BERT | Pytorch, HuggingFace | **GitHub**
  - Fine-tuned BERT model for early sentence interaction in paraphrase detection.
  - Curated the datasets MRPC and TaPaCo for benchmarking the experiments
  - Implemented functions to balance the corpus to mitigate bias & overfitting.

  Advanced Computing | C++, OpenMPI, CUDA, Python, Sockets
  - 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 $O(n)$.
  - Wrote a C++ TCP client-server system using sockets wrapper for real time interaction with the system.

  Network Simulation & IoT Modeling | C++, NS3, Python
  - 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.

  Blockchain Transaction Optimization | Python, Web3, Solidity
  - 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

TECHNICAL SKILLS

- **Languages**: Bash, C++, Go, Python, Solidity, JavaScript
- **Tools**: Ansible, Apache Airflow, ArgoCD, AWS, AWS CloudWatch, Azure, DeepLabCut, Docker, Drone CI/CD, GCP, GCR, Git, Helm, Jenkins, Kubernetes, Lambda, LLMs, MediaPipe, MongoDB, NoSQL, Packer, Prometheus, PyTorch, Terraform
- **Frameworks**: CUDA, MPI, OpenMP, SFML, Jira
- **Development Methodologies**: Agile, DevOps, CI/CD
- **Relevant Courses**: Adv. Programming Tech, High Perf. Computing, Computer Networks, Computer Vision, Generative DL, Neural Networks, Stat ML