Sumant Bagri

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WORK EXPERIENCE

Kindred AI May 2023 - December 2023 (expected)
Robotics Software Intern *Toronto, Ontario*

- Developed a low-latency collision checking pipeline for robotic manipulators leveraging SIMD hardware
- Built two C++ MVPs using CUDA and OpenCL kernels for broadphase and narrowphase collision algorithms
- Achieved 4-4000x speedup in batched collision queries vs. FCL baseline on an NVIDIA Quadro T1000
- Architected MVP integration into existing motion planning stack for seamless utilization across multiple products

Flow Traders Asia October 2020 - April 2022
Trading Operations Engineer *Hong Kong, Hong Kong*

- Implemented a distributed workflow management system using Apache Airflow and Kubernetes
- Worked with development to build and test low-latency trading applications using FPGAs
- Optimized and maintained internal, software and hardware stacks integrated with the Linux kernel

The Walt Disney Company Summer 2018
Data Analytics Intern *Mumbai, India*

- Worked with the Disney Interactive team to improve user experience on their mobile gaming platform
- Automated the data-fetching and report generation for daily review using BigQuery and Python
- Developed a user behavior predictor system using PCA and Random forest increasing in-game purchases by 35%

PROJECT WORK

Diffusion Models on Edge University of Toronto

- Investigated diffusion models for image generation on Nvidia Jetson Nano and Android smartphones.
- Implemented pipelines for FP16 quantization and tensor fusion using ONNX runtime and TensorRT
- Generated high fidelity images on edge devices through diffusion model inference under 90 seconds

Synthetic Image Generation of Brain Tumor MRI Scans University of Toronto

- Implemented and trained UNet-GAN with tuned hyper-parameters using PyTorch
- Trained a brain-tumor CNN classifier using synthetic images achieving 90% accuracy on real images

Comparison of Sampling-Based Path Planners University of Toronto

- Implemented asymptotically optimal, sampling-based path-planners - FMT*, BIT* and NRRT*
- Evaluated path costs, execution times and success rates through simulations on 2D maps

Autonomous Mazerunner Omnibot University of Toronto

- Designed and fabricated an omnibot, integrated with Arduino Mega, to perform a pick-and-place task in a maze
- Implemented PID control using 8 ultrasonic-sensors for accurate collision avoidance

EDUCATION

University of Toronto *September 2022 - December 2023 (expected)*
M.Sc in Applied Computing (A.I.): Deep Learning, Computer Vision, Mobile Robotics **GPA: 4.0/4.0**
IIT Bombay *August 2015 - August 2020*
B.Tech and M.Tech in Mechanical Engineering, Minor in Electrical Engineer **GPA: 8.6/10.0**

PUBLICATION

Bagri, S., et al. "Tool wear and remaining useful life prediction in micro-milling along complex tool paths using neural networks." Journal of Manufacturing Processes (JMP2021)

TECHNICAL STRENGTHS

Programming Languages	C++17, Python
Robotics	ROS2, PhysX, Bullet, FCL, CUDA, OpenGL
Deep Learning	PyTorch, scikit-learn, Matplotlib
Tools	Git, CMake, Bash, Kafka, ELK, Docker, Kubernetes