SUMANT BAGRI

Masters Student (MScAC) @ University of Toronto

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OBJECTIVE

Pursuing Software Engineering and Machine Learning roles in Robotics/Computer Vision/Finance
Passionate about contributing to AI projects through teamwork and collective problem solving

EXPERIENCE

Robotics Software Intern

Kindred AI

May 2023 – Dec 2023 (expected) | Toronto, Ontario

- Evaluated state-of-the-art physics engines like PhysX and Bullet for robotic motion planning
- Engineered a GPU-accelerated C++ MVP using PhysX for concave mesh geometries
- Achieved 4-4000x speedup in batched collision queries vs. FCL baseline
- Architected MVP integration into existing motion planning stack enhancing overall system robustness

Trading Operations Engineer

Flow Traders Asia Pte. Ltd

Oct 2020 – Apr 2022 | 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

RESEARCH/ACADEMIC PROJECTS

Diffusion Models on Edge

Jan 2023 | UofT, Canada

- 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

Comparison of Sampling-Based Path Planners

Dec 2022 | UofT, Canada

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

Synthetic Image Generation of Brain Tumor MRI Scans

Nov 2022 | UofT, Canada

- 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

EDUCATION

MSc, Applied Computing

University of Toronto, Department of Computer Science

Toronto, Sept 2022 – December 2023*

Courses : Introduction to Machine Learning, Introduction to Mobile Robotics, Computational Imaging, Visual and Mobile Computing Systems, Neural Networks and Deep Learning

B.Tech and M.Tech, Mechanical Engineering

IIT Bombay

India, Aug 2015 – Aug 2020

Minor in Electrical Engineering

PUBLICATIONS

Journal Articles

- Bagri, S., Manwar, A., Varghese, A., Mujumdar, S., & Joshi, S. S. (2021). Tool wear and remaining useful life prediction in micro-milling along complex tool paths using neural networks. *Journal of Manufacturing Processes*, *71*, 679–698.

PROFESSIONAL SKILLS

Programming Languages: C++17 | Python

Robotics: ROS2 | PhysX | Bullet | FCL | CUDA | OpenGL

Deep Learning: PyTorch | scikit-learn | Matplotlib

Tools: Git | CMake | Kafka | ELK | Docker | Kubernetes