SUMANT BAGRI

Masters Student (MScAC) @ University of Toronto

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HIGHLIGHTS

One of the key moments of my life was publishing a research paper estimating EoL and wear-grade for non-linear tool-paths in microtools as part of my thesis. In addition to that, I really enjoyed working on a self-localizing omnidirectional robot designed and developed as part of a mechatronics course project at UofT. I am passionate about researching and implementing state-of-the-art deep learning techniques to solve complex, real-world problems in robotics and computer vision and that is exactly what I hope to kickstart through this internship and pursue as a career in the future

EXPERIENCE

Trading Operations Engineer

Flow Traders Asia Pte. Ltd

Oct 2020 – Ongoing | Hong Kong, Hong Kong

- Manage, maintain and optimize all internal, software and hardware stacks largely integrated with the Linux kernel
- Work with development to build and test exchange APIs for different APAC markets
- Implement automated ops-engines and relevant monitoring tools improving control and enabling streamlined deliveries

RESEARCH/ACADEMIC PROJECTS

Capturing cutting tool failure in micro-milling

IIT Bombay

Sep 2019 – Aug 2020 | Mumbai, India

- Developed a novel protocol and designed an experimental setup for micro-milling of non-linear slots
- Implemented an image processing pipeline to extract tool-wear data from captured tool images
- Modelled and tuned ANN and DBN to classify and predict tool-wear and end-of-tool-life based on force and vibration data

Autonomous Navigation and Obstacle Avoidance Robot

Course Guide: Prof. Sinisa Colic

Oct 2018 | UofT, Canada

- Developed a depth first search (DFS) path planning algorithm in C++ for self-localization of robot
- Enabled optimal collision detection using 8 ultrasonic sensors and implemented PID control for obstacle avoidance
- Designed and fabricated a gripper mechanism for payload pick-up and drop-off

Parallelized Implementation of Fast Fourier Transform

Course Guide: Prof. Shivasubramanian Gopalakrishnan

Feb 2018 | IIT Bombay, India

- Parallelized the Cooley-Tukey algorithm for FFT using OpenMP and CUDA
- Computation of 2^{25} sample points using OpenMP led to speedups greater than 6 times that of the linear-recursive implementation

EDUCATION

MSc, Applied Computing

University of Toronto, Department of Computer Science

Toronto, Sept 2022 – December 2023*

Courses(*ongoing*) : Introduction to Machine Learning, Introduction to Mobile Robotics, Computational Imaging, Algorithms for collective decision making, 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/C++ | Python
Robotics/CV: ROS | OpenCV | scikit-image
Cloud Computing: Kubernetes | Docker
Distributed Computing: Hadoop | Disco
Parallel Programming: CUDA | OpenMP
Data Streaming: Kafka | ELK Stack
Databases: BigQuery | PostgreSQL | MariaDB