Tian Yu

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SKILLS

- **Coding**: Python, Javascript, Ruby (Rails), C++, C, MATLAB, Verilog, Assembly
- **Software**: Tensorflow, PyTorch, ROS, NumPy, SciPy, OpenCV, Postgres SQL, Pandas, HTML, CSS, React
- **Concepts**: Control Theory, Modelling, Machine Learning (Under the Hood Understanding), Embedded Systems
- **Tools**: Docker, AWS S3, Google Cloud, Jupyter Notebook, Git, Linux-based Development, Hadoop / MapReduce

EDUCATION

University of Toronto **Sept 2018 - June 2023**

BASc Engineering Science, Robotics

- 3.9 CGPA | High Honours
- Minors in AI, Business
- A+, Numerical Optimization
- A+, Probabilistic Reasoning
- A+, Robotics Computer Vision | Bundle Adjustment, Structure from Motion, Vision Pipeline, Image Processing
- A+, Mobile Robotics and Perception | SLAM, Bayesian Estimation, State Estimation, Motion Planning
- A+, (ECE557, ECE470, AER301, ROB313) | Robotics courses with strong linear algebra emphasis

WORK EXPERIENCE

Overbond **May 2021 - Aug 2022**

Full Stack Engineer *Toronto, Ontario*

- Rebuilt real-time bond pricing feature using **asynchronous Python** on G Cloud for low latency PubSub data streaming to simultaneous clients, greatly contributing to company acquiring third-round startup funding.
- Prepared and post-processed large datasets of 10M+ entries for AI modeling using PySpark and Pandas.
- Automated data processing and ingestion scripts for 100k+ bonds with **Docker deployment on Google Cloud and AWS**, saving over 500 developer hours annually.
- Created interactive **user interfaces with Javascript/React** and a Ruby on Rails and Postgres SQL backend, delivering core features in under a week to sell our product to Sociabank.

Blue Sky Solar Racing Team **Oct 2018 - Aug 2022**

Chief Engineer *Toronto, Ontario*

- **Managed a 50+ student design team** to build a solar-powered vehicle for the American Solar Challenge, a 3000km endurance race across the US using only solar power.
- **Developed relationships with industry sponsors** providing sponsorship packages over $100,000 and **led 8 subteams** in building solar car systems ranging from electronics to composite fabrication.
- Built a telemetry system for receiving and displaying real-time data using Javascript/Electron with <10ms latency for dozens of parameters, allowing our team to monitor SOC and identify and fix electrical failures.

PROJECTS AND ACHIEVEMENTS

Capstone **Sept 2022 - May 2023**

- **Programmed a drone using ROS** to autonomously follow waypoints and avoid obstacles within 40cm accuracy over 10m+ distances using computer vision and lidar sensor fusion.

Coursework **Sept 2020 - May 2023**

- Employed **RRT* algorithms in gazebo simulation** to navigate robots through large (100m+) known regions.
- Mapped semi-dynamic areas in real time using LIDAR and grid-based log-likelihood updating.
- Developed stereo depth estimation code with <10 RMS error over 512 brightness levels on KITTI dataset.

Thesis **Sept 2022 - May 2023**

- **Trained a convolutional neural network** with Tensorflow for Parkinson's symptom detection, with equivalent pance to state-of-the-art methods while using 80% fewer trainable parameters.
- Published results at the IEEE NER 2023 conference. 2023.ieee-ner.org/poster-program | id: 1570869744

RBC Innovation Challenge **Oct 2022 - Jan 2023**

- 3rd place finish, $20,000 prize, developing a startup concept for aerial soil sampling for fertilizer reduction.
- Built a frontend UI in React and automated backend planning through QGroundControl.