JONATHAN SPRAGGETT

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EDUCATION

University of Toronto
Sep 2017 – May 2023

Bachelor of Applied Science Engineering Science - Robotics Major - AI Minor
Toronto, ON

SKILLS & RELEVANT COURSES

- Relevant Courses: Data Structures and Algorithms, Machine Learning, Intro to AI, Computer Vision for Robotics, Robot Modeling and Control, Control Systems
- Programming: C/C++, Python, C#, SQL, Java,
- Software: ROS, Docker, OpenCV, Pytorch & Tensorflow, Git & Linux Environment, Android

WORK EXPERIENCE

Quanta Technology, LLC
June 2020 – December 2022

Software Developer
Toronto, ON

- Optimized algorithm (from $O(n^2)$ to $O(nlogn)$)) and data structure, resulting in a 50% reduction in execution time.
- Designed and implemented database schema and relationships (substation, line, etc.) and successfully imported 50 million entries using SQL.
- Performed data extraction and analysis using advanced SQL techniques, including complex queries utilizing aggregate functions and nested subqueries on multiple source tables.

UTRA Humanoid
Aug 2019 – Present

Robotic Software Developer & Team Lead
Toronto, ON

- Developed software utilizing Python, OpenCV, and ROS for soccer field line detection and robot localization. Implemented Adaptive Monte Carlo Localization (AMCL) algorithm based on laser scans for precise robot positioning.
- Implemented reinforcement learning techniques including Proximal Policy Optimization (PPO) and Imitation Learning to train robot movement control and improve its stability, accuracy, and performance.
- Developed FSM-based AI using machine learning for strategic decision-making in soccer games.
- Led a multidisciplinary team of 30 to build a low-cost humanoid robot to compete at Robocup 2022 in Bangkok, Thailand. Placing 5th.

University of Toronto
Jul 2021 – Sep 2021

Machine Learning Undergraduate Researcher
Toronto, ON

- Developed an entropy-based metric to quantify model-dataset complexity for computer vision models, and applied it to track CO2 emissions from the CV community using Python, TensorFlow, OpenCV, and Numpy.

PROJECTS

Note Transcription using Machine Learning Python, TensorFlow, OpenCV

Developed a machine learning model for classifying musical notes from spectrogram images with 90% accuracy.

AWARDS

MakeUofT 2020 - Best Unconnected Hack Feb 2020

Python, OpenCV, C++, Arduino

Designed and created an innovative autonomous flower pot that uses computer vision and environmental sensors to track and move toward optimal sunlight and water locations

TOHacks 2018 - Winner May 2018

Java, Android

Programmed an android app using IBM Watson API to deliver a satisfying user experience for connecting top applicants with top companies.

PUBLICATIONS

NoFADE: Analyzing Diminishing Returns on CO2 Investment Dec 2021

Python, TensorFlow, OpenCV

Published 35th Conference on Neural Information Processing Systems
https://arxiv.org/abs/2111.14059