Michael (Spok) Szpakowicz

\$ 416-602-7520

Experience

Robotics Software Engineer

- Lead a team of three to create a service robot for hospitals and nursing homes. The robot uses a large language model to communicate with users and create plans for finding, picking up, and delivering items.
- Developed a real-time human tracking solution, enabling a motorized golf caddy to follow a player.
- Created a camera-based part-locating program for robotic pick-and-place systems used by 3 of our clients. Implemented SLAM to allow a restaurant delivery robot to navigate indoor environments autonomously.

Self Driving Cars Specialization Instructor

 Verified and corrected course materials to enhance learning outcomes in Introduction to Self Driving Cars. a specialization taken by over 250,000 students since its release in 2019.

Teaching Assistant

- Built and configured 5 autonomous driving platforms for student use for Intro to Mobile Robotics.
- Led weekly tutorials for up to 40 students, marked tests and assignments within a week of their completion, and provided extended office hours on Software Design and Computer Organization courses.
- Answered student questions during Into to Programming lectures to clarify any confusion in course content.

Set Animation Engineer

• Implemented a programmable waterfall simulation using 5 LED strips and a microcontroller.

• Developed an Arduino library for complex PWM signal sequencing, resulting in 60% less programming.

Projects and Hobbies

Graduate Research

Throwing Robot: 2023 - Present

Little Canada: 2017 – 2018

• Developing a reinforcement learning framework for teaching throwing behaviour quickly and safely.

Undergraduate Research

- Worked with a team of 6 at the RVL Lab on 5 autonomous mobile platforms to study the influence of digital billboards on vision-based self driving cars through adversarial noise. Our convolutional neural networks showed promising results after significant neural network optimization.
- Collaborated with 2 other students to convert 3 toy cars into smartphone-based, indoor self-driving platforms. Multiple approaches were attempted but imitation learning proved best, and the cars were able to safely complete a loop through campus hallways.

Club Founder, Lead, and Mentor

UTM Robotics Club: 2019 – 2021

- Led weekly meetings on design, electronics, control systems, autonomous vehicles, and drones.
- Conducted workshops on Arduinos, 3D Printing, PID Loops, and Deep Learning.
- Created a self-balancing pendulum and began implementing SLAM on MIT Racecars.

Technical Skills

Robotics Tools: Python, C++, CARLA, ROS, Gazebo, PyBullet, OpenCV, Linux ML Frameworks: PyTorch, Lightning, TensorFlow, Keras, TensorRT, stable-baselines3 ML Networks: PPO, HER, VAE, GPT, YOLO, AlexNet, CNN, RL

Education

M.Eng. Robotics Engineering

H.B.Sc. Computer Science Specialist

University of Toronto - 2023 University of Toronto - 2020

Autonomous Car Projects: 2019 & 2020

Coursera: 2022 – 2023

AdMetal/BeaverBot: 2021 – Present

University of Toronto: 2017 – 2020