Ali Kuwajerwala

Actively seeking software engineering or research roles at this time.

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Experience

Robotics Researcher - UofT (Summer 2020)
NSERC USRA Position
Supervisor: Prof. Florian Shkurti
Result: Backwards Reachability Tutorial
Goal: Safety guarantees for autonomous robots.

- Conducted research on reachability analysis, attempting to efficiently compute the safe exploration sets of autonomous robots using **Python**, **Matlab**, and **C++** with **CUDA**.

Software Developer - EPSON (2018-2019)
Robotics (Computer Vision / Evaluation Team)

- Developed 3D object detection and pose estimation technologies for commercial bin picking robots.
- Automated evaluation tasks using **Python** and **Bash**, substantially increasing (upto 5x) the amount of tasks run each day.
- Evaluated algorithm concepts and analyzed research results to diagnose and fix detection/estimation issues.

Teaching Assistant - UofT (2017-Present)
- Intro to Mobile Robotics (CSC477)
- Data Structures and Analysis (CSC263)
- Intro to Theory of Computation (CSC236)

Education

University of Toronto (2015 - 2020)
H.B.Sc. Computer Science Specialist
& Mathematics Major
CGPA: 3.63 - Dean's List Scholar
Award(s): NSERC Undergrad Student Research Award, value $ 4500 for Robotics Research.

- UTM Robotics Club
(Co-Founder / Head of Operations)
- Ongoing Project: Using robot cars to collect garbage on campus.

- UTM MCS Society (VP of Internal Affairs)

Projects

Feature Visualization for Neural Networks (Jupyter Notebook Tutorial):

- Built an interactive tutorial demonstrating how Neural Networks build up their understanding of images using **TensorFlow**, **DeepDream** and **Lucid**.
- Used as a workshop for the UTM ML Reading Group and the UTM Robotics Club.

Autonomous Driving Through Imitation Learning (Research Project under the UofT Robotics Institute):

- Used **PyTorch** and **ROS** to test a range of ML techniques implemented on a RC Car using the MIT Racecar platform.
- Performed adversarial attacks on the network and analysed its effects on performance.

NeoCirkuits (Android App):

- Made a math (graph theory) based puzzle game for Android using **Java** in **Android Studio**.
- Implemented a fully featured creator tool allowing users to create their own levels.
- Collaborated with Professor Alex Rennet to use NeoCirkuits in the 'Introduction to Combinatorics' course at UofT.

Software Skills

Languages	Python, C/C++, Java
Technologies	PyTorch, ROS, OpenAI Gym, OpenCV, Android Studio, CUDA