Ali Kuwajerwala

Actively seeking software engineering or research roles at this time.

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Experience

Robotics Researcher - UofT (2020-Present)
NSERC USRA Position
Supervisor: Prof. Florian Shkurti
Topic: Backwards Reachability
Goal: To provide safety guarantees for safety-critical systems with non-linear dynamics.

- Currently using **Python, Matlab, C++** with **CUDA** to efficiently compute the backwards reachable sets of unsafe states to see if the control policy ever reaches them.

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)
- 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.
- Organized and led Deep Reinforcement Learning workshops and project demos.

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, Java
Technologies	PyTorch, ROS, OpenAI Gym, OpenCV, Android Studio, CUDA