Ali Kuwajerwala

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Actively seeking research/software engineering roles in machine learning and/or robotics.

Experience

Robotics Researcher, RVL Lab Fall 2020 – Present
Robot Vision and Learning Lab, University of Toronto *Toronto, ON*

- Investigated the use of equivariant image augmentations for improved driving performance in autonomous robots.
- Responsibilities: data collection, performing simulation experiments, designing/debugging the ANN architectures.
- Performed real robot experiments with a Husky robot; including sensor setup and ROS Node configuration.

Undergraduate Researcher, RVL Lab Summer 2020
Robot Vision and Learning Lab, University of Toronto *Toronto, ON*

- Conducted research attempting to efficiently compute the safe exploration sets of autonomous robots.
- Published tutorial outlining available methods, reachability theory & current challenges on RVL Lab website.

Software Developer, EPSON Jul. 2018 – Apr. 2019
Vision Team, Robotics Department, EPSON Canada *Markham, ON*

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

Teaching Assistant, University of Toronto CS Sep. 2017 – Present
Department of Computer Science, University of Toronto *Toronto, ON*

- Modified and updated existing assignments for remote delivery (using ssh and VNC) during the pandemic.
- Courses: Mobile Robotics (CSC477), Data Structures and Analysis (CSC263), Theory of Computation (CSC236).
- Prepared and taught lectures, designed & graded assignments, designed marking schemes & graded tests.

Projects

All code available on Github.

Feature Visualization for ANNs (Workshop) | *Jupyter Notebook, Python, Tensorflow* Dec. 2019 – Present

- Built an interactive tutorial demonstrating how Neural Networks build up their understanding of images.
- Presented workshop at Prof. Lisa Zhang's ML Reading Group, UTM Robotics Club, Math & CS Society.
- Workshop rated 4.4/5 stars in feedback survey, with 60% of respondents requesting follow-up workshop.

Experiments in Autonomous Driving via Imitation Learning | *PyTorch, ROS* Sep. 2019 – Dec. 2019

- Implemented an autonomous driving pipeline on a RC Car using the MIT Racecar platform.
- Investigated the effect of adversarial attacks on the network's performance.

NeoCirkuits (Android App) | *Java, Android Studio* Summer 2018

- Developed a math (graph theory) based puzzle game for Android with 60+ levels included and a level creator tool.
- The game is used as a learning resource by Prof. Alex Rennet in the Intro to Combinatorics course at UofT.
- Currently has 500+ downloads on the Play Store and rated 4.9/5 stars. All code available on Github.

Education

University of Toronto
H.B.Sc, Computer Science & Math ***CGPA:*** *3.63* *Sep. 2016 – May 2020*

- **Award:** Received the NSERC Undergraduate Student Research Award, a value of $5600. (2020)
- **Extracurricular:** Co-Founder & Head of Operations of the Robotics Club. (2019-2020)
- **Extracurricular:** Elected VP of Internal Affairs of the Math and Computer Science Society. (2019-2020)

Technical Skills

Languages: Python, C/C++, Java, SQL
Developer Tools: ROS, OpenAI Gym, Andriod Studio, CUDA, ssh, VNC
Libraries: PyTorch, Tensorflow, OpenCV, pandas, NumPy, scipy, Matplotlib, Plotly