Sahil Pereira

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Education

2017–Present **MASc in Computer Engineering**, *University of Waterloo*, Canada.
Advisor: Mark Crowley
Centre for Pattern Analysis and Machine Intelligence
Cumulative GPA: 3.94/4.0

2012–2017 **BASc in Computer Engineering**, *University of Waterloo*, Canada.
Graduated with Distinction
Cumulative GPA: 3.7/4.0

Research Projects

Fall 2017–Present **Driver Behaviour Learning**.
Working on imitating individual driver behaviour using real driving data. Preprocessing raw multi-sensor data to enable training policy networks. Building a model to imitate 6 key driving behaviours, given the preprocessed and simulated trajectories, using a generative-adversarial framework and reinforcement learning.

Summer 2018 **Driving Model Based on the Stackelberg Game**.
Analyzed the Stackelberg game theoretic model for integration into a multi-agent driving environment. Involved predicting the states of other agents in the future using a hierarchical assumption. Built a driving agent to select 1 of 5 actions at 4Hz to avoid obstacles and maximize distance travelled.

Winter 2018 **Vehicle Perception and Trajectory Prediction**.
Worked on planning short portions of a vehicle's future trajectory based on current state. This involved localizing surrounding vehicles in a video stream, predicting the trajectories of these dynamic obstacles and learning a policy for highway driving. Implemented Faster R-CNN for localization, LSTM and GRU for obstacle trajectory predictions and used inverse reinforcement learning for policy training.

Winter 2018 **Real-time Object Segmentation and Tracking**.
Worked on instance level video object segmentation, tracking and identification. Required a real-time tracking module, along with methods for object re-identification and handling long term occlusions. Modified Mask R-CNN for better tracking, used Siamese network and k-means clustering for re-identification after occlusions.

Fall 2017 **Restoration of Murals**.
Analyzed different algorithms for reconstruction and restoration of mural images. Involved learning sparse dictionary from small patches of target image, and training context-encoder on natural images to reconstruct missing segments. Results were tested using no-reference image quality assessment techniques.

Work Experience

Summer 2017 **Software Developer - Cloud Applications**, *Autodesk*, Toronto.
Implemented services to enable zero downtime and continuous deployment of the application. Updated the application bootstrapping procedure to allow for faster updates, which reduced deployment time by 30 minutes.

Fall 2016 **Software Developer - Cloud Applications**, *Autodesk*, Toronto.
Integrated Amazon Route 53 DNS web service into the application to handle routing to different endpoints. Implemented backend resources to support creation, retrieval and execution of scripts used to manipulate data.

Winter 2016 **Video Software Developer**, *Imagine Communications*, Toronto.
Implemented demultiplexing support for Quick Time movie files and improved its performance by 200%. Integrated audio and video metadata updaters into specific source components. Updated latency measurement and data visualization components for better compatibility.

Summer 2015 **Software Engineering Intern**, *Veeva Systems*, Toronto.
Developed web crawlers to collect data from web pages, and scripts to extract required information. Implemented utilities to perform pattern recognition, and data parsers. Integrated data validation process into existing tools to ensure consistent and high quality data.

Fall 2014 **Software Engineering Intern**, *Symcor*, Mississauga.
Developed a web portal to access archived data through dynamic queries.
Created scripts to compare web service responses from diverse environments.
Presented demos to stakeholders and participated in project planning.

Winter 2014 **Software Engineering Intern**, *PointClickCare*, Mississauga.
Automated the process of performing application specific setups using Java.
Participated in bug fixes and code reviews.

Summer 2013 **Software Engineering Intern**, *Citigroup*, Mississauga.
Automated testing for web based applications using Selenium and Java

Coursework

Graduate Deep Learning, Machine Learning, Reinforcement Learning, Game Theory, Data Modelling and Analysis, Image Processing

Undergrad Pattern Recognition, Cooperative and Adaptive Algorithms, Distributed Computing, Computer Security, Compilers, Database Systems

Technical Skills

Languages Python, Java, C/C++, Matlab, Scala, Groovy, JavaScript

Tools TensorFlow, Keras, PyTorch, Hadoop, Apache Spark, PostgresSQL, Pygame, Docker, Apache Thrift, AWS SDK

Concepts Bayesian Inference, Markov Processes, Genetic Algorithms, Consensus Algorithms, Swarm Intelligence, Remote Procedure Calls, Distributed File Systems

Extracurricular

Fall 2018 **Peer Reviewer**, *AI for Social Good Workshop*, NIPS (NeurIPS) 2018.

Winter 2018 **Teaching Assistant**, *Database Systems (ECE 656)*, Graduate Course.