Alex Tomala

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Employment History

University of Waterloo - Autonomoose January 2017 – Current

Autonomous Driving Research Assistant

- Investigating techniques to improve object detection in Autonomous Cars using Deep Learning
- Developing a tool in Python to generate 3D environments through augmented OpenStreetMap data

Massachusetts Institute of Technology May 2016 – August 2016

Research Assistant

- Created a novel method of determining material synthesis similarity and wrote about it for a future paper
- Investigated methods to classify scientific papers using Machine Learning methods in Python. Results are in a paper that is currently in peer review for Scientific Data (Nature subjournal).
- Created a web app written in D3.js that reduces annotation time of material synthesis data by 90%

University of Toronto Institute for Aerospace Studies April 2015 – August 2015

Research Intern

- Worked on classifying (using C++) ceiling lines to improve localization for an autonomous wheelchair
- Developed a web app (using React and ROS) to manage the wheelchair using a touchscreen tablet

Skills

Programming Languages: Python, C, C++, Racket, MIPS assembly, Coq

Machine Learning: Keras, Scikit-learn, Gensim, Tensorflow, Jupyter Notebook, MongoDB

Other: D3.js, React, ROS, Computer Networking, Computer Architecture, Latex, VHDL, FPGA, Docker

Education

University of Waterloo September 2015 – 2020

Candidate for Bachelor of Computer Science - 2B - 98% Major average

- Selected Courses (Advanced Level): Functional Programming, Calculus I-III, Linear Algebra I/II, Algebra, Logic and Computation, Data Structures
- Currently auditing a graduate course on Autonomous Driving Perception

Projects

An Innovative Approach to Multi-Core Interconnection Networks July 2013 – April 2014

- Implemented an innovative tree-based memory system onto a FPGA and a software simulator (GEM5)
- GEM5 implementation is planned to be used for current research at MIT

MIPE: Microprocessor with Integrated Programmable Execution Units July 2012 – April 2013

- Created a 5-stage RISC microprocessor based on the MIPS32 ISA using VHDL
- Designed the architecture so the instruction set can be reconfigured to suit different tasks
- Developed an assembler in Java to simplify programming the processor

Notable Awards

CWSF Senior Informatics Award May 2014

- Best Grade 11-12 computing project at the Canada Wide Science Fair, the largest national science fair.

Intel Excellence Award - Computer Science May 2014, May 2013

- Best computing project at the Bay Area Science and Engineering Fair, one of the largest science fairs in Canada.