DANIEL LAWRENCE LU

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EDUCATION

Carnegie Mellon University Aug 2014 – Aug 2016
Master of Science
Robotics Institute, Advisor: George Kantor GPA: 3.76
Thesis: *Vision-Enhanced Lidar Odometry and Mapping*

University of British Columbia Sep 2008 – May 2014
Bachelor of Applied Science
Engineering Physics, Specialization in mechatronics GPA: 82.1% (A-)

SKILLS

Languages: C++, C, CUDA, Haskell, HiveQL, Javascript, MATLAB, PHP, Python, SQL
Operating system: GNU/Linux
Canadian citizen fluent in English and Mandarin.

WORK

Ouster, San Francisco CA Aug 2016 – present
Software Engineer, Mapping C++14, ROS

- Architected and implemented core algorithms as the first software engineer;
- Real time inertial-lidar 6DoF SLAM with continuous, differentiable vehicle trajectory to accommodate different sensor rates and rolling shutter or spinning sensors (3× Ouster OS-1 64-beam lidar);
- Offline batch-processed point cloud registration for extremely large scale, globally consistent, loop-closed, georeferenced multi-agent mapping;
- Automatic lidar extrinsic calibration with RANSAC;
- SIMD implementation of SE(3) Lie group operations;
- Novel method of real time ground segmentation of unordered point clouds using computational geometry;
- Various high quality visualizations and evaluation tools.

Carnegie Mellon University, Pittsburgh PA Aug 2015 – Aug 2016
Graduate Student Researcher C++11, ROS

- Real time visual-inertial-lidar 6DoF SLAM for autonomous off-road vehicle with Velodyne HDL-64E.

Facebook, Seattle WA May – Aug 2015
Software Engineering Intern Hack/PHP

- Full stack development for the Save For Later functionality.

Facebook, Seattle WA — May – Aug 2014
Software Engineering Intern — C++, HiveQL, Hack/PHP

- Collaborative filtering algorithms recommending Facebook Pages;
- Data processing to aggregate features from multiple sources.

University of British Columbia, Vancouver BC — May – Dec 2011
Research Assistant — C++, CUDA

- Real time registration of ultrasound and CAT scans.

Pierre Zakarauskas (Zak Technology), Vancouver BC — Jan – Apr 2010
Engineering Co-op Student — MATLAB

- Localizing bats and birds by multilateration using microphone array;
- Bat species classification using audio spectrogram cross-correlation.

PROJECTS

Line scan camera image processing: Total variation denoising, demosaicing, and colour calibration of a line scan camera for high resolution train photography (github.com/daniel-lawrence-lu/nectar) (2018)
Water hazard detection: Visual-lidar system to detect puddles in cluttered environment (2016)
Inertial parameter estimation: Using onboard lidar to infer vehicle inertial properties (2015)
dllup markup language: System to typeset webpages and technical reports including my thesis (2015)
Cellular automata: A new family of cellular automata (arxiv.org/pdf/1501.00733) (2014)
Self-solving Rubik's Cube: 3D-printed Rubik's Cube with internal motors to rotate itself (2013)
Quaffle the quadrotor: Micro aerial vehicle built from scratch (2012)
Rock-paper-scissor algorithms: Ensemble learning algorithms to predict opponent moves (2011)