

## Christopher L. Choi

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email: [chutsu@gmail.com](mailto:chutsu@gmail.com)  
website: <http://chutsu.github.io>

### RESEARCH INTERESTS

Visual Inertial Odometry (VIO)  
Micro-aerial vehicles (MAVs)  
Genetic Programming (GP)

### EDUCATION

MASc Mechanical Engineering September 2015 — April 2018 (expected)  
[University of Waterloo](#), Canada.

Advisor: Prof Steven Waslander  
Concentration: Autonomous Systems  
Modules: Deep Learning, Autonomous Mobile Robotics, Fuzzy Logic

MSc Advanced Computer Science September 2011 — September 2012 (1 year)  
[University of St Andrews](#), Scotland

Concentration: Data mining, Software Engineering  
Modules: Advanced Software Engineering, Advanced A.I., Advanced Network and Distributed Systems, Software Architecture, Language Perception.

BSc Computational Physics September 2007 — June 2011 (4 years)  
[HeriotWatt University](#), Scotland

Concentration: Chaos Theory, Fast Fourier Transform  
Modules: Remote Sensing and Energy Studies, Applied Quantum Theory and Spectroscopy, Physical Mathematics.

### EXPERIENCE

Software Engineer Intern September 2014 — September 2015 (1 year)  
[Silicon Valley Internship Programme \(SVIP\)](#), San-Francisco, USA

At [Cask Data](#) I implemented an Integration Testing Framework in Python. My second and current experience is at [LoopUp](#), a call conferencing company where I am creating a fraud notification system, the system is was implemented in Python and Flask.

Research Assistant September 2012 — May 2013 (9 months)  
[University of St Andrews](#), St-Andrews, Scotland

Surveyed NoSQL databases such as MongoDB and CouchBase, and presented my work at the International Symposium on Grids and Clouds (ISGC) in Taipei, Taiwan.

Physics Summer Internship July 2009 — September 2009 (3 months)  
[HeriotWatt University](#), Edinburgh, Scotland

Created a ruby script that would allow researchers perform physics simulations across a number of Linux machines.

Bioinformatics Summer Internship June 2009 — September 2009 (4 months)  
[University of Edinburgh](#), Edinburgh, Scotland

Helped Dr T.Waibel analyze his sequenced data to identify key gene regulators in Taxol bio-synthesis found in Yew trees. Taxol (a.k.a Paclitaxel) is one of the major chemotherapy drug used to treat patients with lung, ovarian, breast, head and neck cancer.

Physics Summer Internship June 2008 — August 2008 (3 months)  
[Queen Mary, University of London](#), London, England

Ported a computer program called Rivetgun to work under [BOINC](#). The work required C/C++ programming and system administration under Debian Linux. I also built temperature sensors to monitor the High Throughput Cluster at Queen Mary. Temperature values were then logged to a web based system monitoring software called Zabbix.

## PROJECTS

[Encoderless Gimbal Calibration](#) March 2017 — September 2017

Designed and built a custom quadrotor with a gimbal camera using off the shelf components. Additionally I collected over 50 different flight data used towards a novel camera to gimbal camera extrinsics calibration research paper. The custom built quadrotor is one of a kind, (as of Nov, 2017) there is no quadrotor on the consumer market that allows the developer to control the gimbal camera and obtain live image data during flight (DJI's limited API only allows programs to access photos and video stream after flight, [see here](#)).

[Autonomous Tracking and Landing \(ATL\)](#) January 2016 — March 2017

Implemented combination of linear flight controllers and Kalman filters to perform vision-based autonomous quadrotor landing using C++ and ROS. Made performance tweaks to the vision processing of AprilTag detection for a 1.5x to 2x speed up, and added robustness under different lighting conditions.

[playground](#) September 2013 — September 2014

A meta-heuristic library implemented in python. The most impressive feature is symbolic regression where it regresses mathematical variables and constants, not just model parameters ([Demo](#)).

[CRoPs](#) July 2013 — February 2013

A path planning algorithm that combines potential fields and probabilistic roadmaps to guide a swarm from an initial configuration to a final configuration. ([Demo](#))

## PUBLICATIONS

C.L. Choi, J. Rebello, L. Koppel, P. Ganti, A. Das, S.L. Waslander. "Encoderless Gimbal Calibration of Dynamic Multi-Camera Clusters". IEEE International Conference on Robotics and Automation (ICRA), Brisbane, 2018. **(Still in Review)**

## AWARDS

[2nd Place, HackKings Hackathon](#) February 2014

My team and I created Streamy, a product that uses Twitter to locate and target users close to the news worthy locations to stream live video from their phone. Using only HTML5 and JavaScript we were able to access the user's phone camera directly and stream the video back to a centralized server without requiring the user download any phone specific app, check out this [demo](#).