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## EDUCATION

**Carnegie Mellon University, School of Computer Science** Dec 2017

Master of Science in Computer Vision (MSCV), GPA: **4.11/4.33**

**National University of Singapore - Dual Degree Program** May 2016

Bachelor of Computing (Computer Science, Honors, Highest Distinction), GPA: **4.84/5**

Bachelor of Engineering (Industrial and System Engineering, Honors, Highest Distinction), GPA: **4.72/5**

### Specialization and Core Courses

Geometry Computer Vision Visual Learning and Recognition Large-Scale Multimedia Analysis Machine Learning

### Awards

- Singapore NCS Medal and Prize 2016 (Top Student in B.COMP in NUS Computer Science, out of a cohort of 400)

## SKILLS

**Programming Languages:** Python (Proficient), C++, Java, MATLAB, JavaScript, HTML5, CSS, SQL

**Frameworks/Platform:** OpenCV, Eigen, Boost, Caffe, TensorFlow, Theano, Lasagne, Torch, Dlib, g2o; Ubuntu, RHEL

## WORK EXPERIENCE

**Amazon.com, Inc., Visual Search, Applied Scientist Intern** Summer 2017

- Developed a quasi-linear multi-camera calibration algorithm for turntable sequences for 3D modeling; More than 100 3D models produced per day using calibration results from this method in production.
- Implemented a probabilistic visual-hull 3D reconstruction algorithm tackling uncertainty in camera calibration
- Developed a simple texture mapper for mesh colorization; Created synthetic 3D data for quantitative analysis

**Volvo Construction Semester Co-op, Research Engineer, with Professor Kris M. Kitani** Spring 2017

- Developed a generic single-object visual tracker (model-free) using Siamese Convolutional Neural Network
- Tracker accepted to VOT2017 Challenge Workshop (in conjunction with ICCV)

**JPMorgan Chase & Co., Global Enterprise Technology Department, Application Developer** Summer 2015

- Built temporary backend storage of Trade Surveillance Platform; Earned team 2 weeks for database upgrade
- Enhanced UI/UX of Trade Surveillance Platform using Ext.js and Embedded a testing framework with QUnit.js

## PROJECTS

**TRECVID 2017 Video-To-Text Competition, in TensorFlow** Spring 2017

- Adapted Spatial Show-Attend-and-Tell architecture with inception-v3 feature for video captioning
- Integrated spatial attention, semantic tag injection and multi-model fusion (MFCC feature) for overall pipeline

**Video Super-Resolution using Temporal Fusion Generative Adversarial Network, in Lasagne, Theano** Spring 2017

- Developed a generator architecture with various temporal fusion: early fusion, slow fusion and 3D convolution
- Devised an adaptive training routine for effective training and reduction of parameter hand-tuning

**Monocular SLAM: A system framework for Keyframe Feature Based Monocular SLAM, in C++** Fall 2016

- Implemented core Bundle Adjustment component for camera pose and map points optimization with g2o
- Developed the system structure with Software Design Patterns, e.g. Central Repository/Pipes and filters Pattern

## RESEARCH EXPERIENCE

**Research Assistant, Visual Odometry in oscillating environment, with Professor Aaron M. Johnson** Fall 2016 - 2017

- Analyzed Direct/Feature-based Monocular Visual Odometry, SLAM methods; Mounted pipeline on XRHex robot
- Developed a robot person-following pipeline using fusion of SSD object detector and GOTURN tracker

**Wide-Baseline Correspondence Matching: Detect Unique Features In a Scene, in Python** Fall 2015 - Summer 2016

- Developed Bag of unique features construction and detection algorithm with spatial color information and HOG
- Devised integral-image based multi-scale correspondence matching algorithm (more robust than SIFT/SURF)

**A Real Time Simulation Optimization Framework for Vessel Collision Avoidance and the case of Singapore Strait, Submitted to IEEE Transactions on Intelligent Transportation Systems, in Python, C++** Fall 2015 - Summer 2016

- Accomplished vessel pattern recognition via unsupervised learning algorithm; Simulation in Agent Based Model
- Earned NUS Faculty of Engineering 30<sup>th</sup> Innovation & Research Award, given to 20 students out of 3000 cohort