Brandon Leung

b7leung@ucsd.edu | github.com/b7leung
(949) 394-8599 | Citizenship: United States

Education:

- **UC San Diego – B.Sc, Computer Science** 2015 - 2019

Senior, 3.88 GPA; 3.97 major GPA.

Research Experience:

- **Multiview Drone Dataset for Computer Vision/Machine Learning**
  - Lead developer of a novel drone-flight system which rapidly collects object images at many viewpoints, towards a pose dense dataset: 500 objects, 120,000 images.
  - Designed robust algorithms utilizing ROS to integrate computer vision, PID controls, a state machine, and python code for drone flight.
  - Had a major role in project's success; led meetings, oversaw progress, and recruited members.
- **Pose Invariant Classification**
  - Implemented a modified U-Net to segment drone images and placed on the MIT Places dataset.
  - Showed that the drone dataset complements ImageNet to provide more pose robustness, by fine-tuning on pretrained CNNs (AlexNet, VGG, and ResNet).
  - Demonstrated that utilizing an MVCNN with Deep CORAL can further improve classification and retrieval, even across different domains.
  - Proposed a novel few-shot task trained with only a few object instances but is allowed many views; implemented SVM and Prototypical Network embedding derived solutions.
  - Work performed with PyTorch, to be submitted to ICCV 2019 for review.
- **Semantic Adversarial Attacks**
  - Researched the novel concept of "semantic" adversarial attacks, wherein natural perturbations arising from drone camera shake and viewpoint affect CNN classification.
  - Designed Amazon Turk-based experiments to generate imperceptible samples based on human perception, rather than an L_P-norm metric as is standard in the literature.
  - Elucidated vulnerabilities of CNNs to these attacks in a paper submitted in review, CVPR 2019.

Scholarly Activity:

- ***OOWL500: Overcoming Dataset Collection Bias in the Wild.***

Brandon Leung, Chih-Hui Ho, Yen Chang, Erik Sandstrom, Bo Liu, and Nuno Vasconcelos.
In preparation: ICCV, 2019.
www.svcl.ucsd.edu/people/brandon/OOWL.pdf

- ***Catastrophic Child's Play: Easy to Perform, Hard to Defend Adversarial Attacks.***

Chih-Hui Ho, **Brandon Leung**, Erik Sandstrom, Yen Chang, and Nuno Vasconcelos.
Currently submitted in review: CVPR, 2019.
www.svcl.ucsd.edu/people/brandon/Semantic.pdf

Work Experience:

- **SVCL – Computer Vision/Machine Learning Research Intern** April 2017 – Present

Performing research under Prof. Vasconcelos at the Statistical Visual Computing Lab, UCSD. Working with drone images to investigate computer vision problems related to pose invariance, ImageNet bias, domain adaptation, and multi-view classification using PyTorch.

- **Himax Imaging – R&D Software Intern** Summer 2015 & 2016

Developed internal quality control programs in Java for a R&D/fabrication company specializing in CMOS image sensors used in smartphone cameras and car backup cameras.

Technical Skills:

- **Languages** Python, Java, C++, C, HTML, CSS, JavaScript
- **Frameworks/Tools** PyTorch, OpenCV, AWS, ROS, JUnit, Linux shell scripting

Teaching Experience:

- **UCSD – DSC 40A (Data Science Theoretical Foundations II) Tutor** Fall 2018
- **UCSD – DSC 40B (Data Science Theoretical Foundations I) Tutor** Spring 2018
- **UCSD – CSE 8A (Introduction to Programming Java) Tutor** Winter 2018

As tutor, I hold office hours, hold review sessions, grade, proctor exams, and generally strive to be accessible to students.

Other Projects:

- **Amazon Purchase Recommender System**
  - Developed a recommender system based on latent factor modeling and support vector machines, to recommend Amazon items based on user history, text-based features, and trends.
- **DejaPhoto Android Application**
  - Worked in an Agile team to develop an engaging photo gallery app which dynamically changes based on the user's past experiences.

Scholarships:

- **National Science Foundation (NSF) REU Research Grant** 2018
- **Qualcomm Alumni Scholarship** 2018
- **Ledell Research Scholarship for Science and Engineering** 2018
- **UC LEADS Scholar*** 2017 - 2019

** A selective program that funds/prepares promising first-generation/minority students for graduate level research.*

Honors:

- Caledonian Society inductee 2018
- Phi Beta Kappa honor society 2018

Conference Presentations:

- UC LEADS Symposium 2018
- SRC at UC San Diego 2017

Other:

- Mentored computer vision for ENLACE 2018 at UCSD, a high school program to promote diversity in scientific research.
- Fluent in Chinese (Cantonese).
- Classical pianist for 17 years; Level 10 CM, 2014 MTAC Contemporary Festival 1st place winner.