# HUBERT LIN

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## EDUCATION

Cornell University, PhD — Aug 2016 – Present
Computer Science

University of Toronto, HBSc. — June 2016
Major in Computer Science, Major in Physics, Minor in Mathematics

CGPA: 3.99 / 4.00

## PROFESSIONAL EXPERIENCE

**Research Assistant**, University of Toronto — Toronto, ON
Computer Vision — Sept 2015 – Dec 2015

- *The current focus of the project is to examine the effects of different noise models in 3D protein reconstruction from electron cryomicroscopy images*
- Generated synthetic images corrupted with different colors of noise
- Worked with existing Python codebase to run reconstruction experiments on these images
- Course project supervised by Professor David Fleet and Dr. Marcus Brubaker (now Professor Brubaker)

**Research Assistant**, University of Toronto — Toronto, ON
Natural Language Processing — May 2015 – Sept 2015

- *The focus of the project was to design a communicative robot that guides cognitively-impaired persons through a picture-description task*
- Implemented sensory component that detects utterances, records audio data and performs speech recognition, extracts features including indicators of progress in the task, and processes features to estimate confusion in the user
- Wrote code in (and interfaced between) several programming languages, including C#, Python, MATLAB, JavaScript
- Collaborated with a team of 7 researchers, including two other undergraduate students
- Funded by NSERC USRA and supervised by Professor Frank Rudzicz and Professor Sheila McIlraith

**Teaching Assistant**, University of Toronto — Toronto, ON
CSC108: Introduction to Computer Programming — Sept 2014 – Dec 2014

- Held weekly help-hours to aid introductory programming students spanning a wide range of disciplines
- Worked closely with students and explained concepts with the use of examples, analogies, pseudo-code, diagrams, and various viewpoints on the same topic
- Taught pen-and-paper problem solving strategies for approaching and debugging coding assignments
- Marked assignments and exams in an analytical and consistent manner; provided constructive feedback to students

**Research Assistant**, Institute for Quantum Computing — Waterloo, ON
Quantum Cryptography — May 2014 – Aug 2014

- *The focus of the project was to close the gap between the upper upper-bound and lower upper-bound in quantum bit error rate for secure key generation in the six-state quantum key distribution protocol*
- Independently implemented subroutines in MATLAB that allowed the numerical representation of multiple identical Werner states and the generation of effective states from the action of different operators on these initial states
- Determined (im-)possibility of secure key generation through solving for symmetric extendability of the effective

states by using previous work to convert the problem to a semidefinite programming feasibility problem
- Contributed findings during weekly group meetings and collaborated closely with supervisor
- Funded by NSERC USRA and supervised by Professor Norbert Lütkenhaus

## PRESENTATIONS

**DCS Undergraduate Student Research Program 2015**, University of Toronto — Toronto, ON
- Title of talk: "Robot that Interacts with People with Alzheimer's Disease" (with Chen, O. & Guo, H.) — Jul 14, 2015

**Canadian Undergraduate Physics Conference 2014**, Queen's University — Kingston, ON
- Title of talk: "The Quantum Key Distribution Gap Problem" — Oct 25, 2014

## PUBLICATIONS

Chinaei, H., Chan Currie, L., Danks, A., **Lin, H.**, Mehta, T., Rudzicz, F. (Accepted) *Identifying and avoiding confusion in dialogues of people with Alzheimer's Disease*. Computational Linguistics.

Chen, O., Guo, H., **Lin, H.** (published) *An Intelligent Guidance System for People with Dementia in a Picture Description Task.* Review of Undergraduate Computer Science, University of Toronto (2015).

## HONOURS AND AWARDS

- NSERC Canada Graduate Scholarship M 2016 (Declined)
- Dean's List 2013 – 2015
- A&S Students' Union Fourth Year Bursary 2015
- Donald G. Ivey Scholarship in Physics 2015
- New College Council In-Course Scholarship 2015
- NSERC Undergraduate Student Research Award 2015
  - Computer Science, University of Toronto
  - CAD$6,000
- Jane Seto Bursary 2015
- William Ramsay Scholarship in Physics 2014
- Harry Boxen Memorial Scholarship in Physics 2014
- Luc and Pamela Vanneste Award 2014
  - CAD$10,000
- NSERC Undergraduate Student Research Award 2014
  - Physics, University of Waterloo
  - CAD$8,000
- Leslie Langbord Saunders Physics Scholarship 2013
- J. A. Priestley In-Course Scholarship 2013
- New College Principal's Scholarship 2013
- New College Alumni Association In-Course Scholarship 2013
- Silver Medal (Top 20%) University Physics Competition 2012 & 2014 (International)
- New College Admission Scholarship 2012
- University of Toronto Scholar's Award 2012
  - CAD$5,000
- Top 15 Junior Canadian Computing Competition 2011

## RELEVANT COURSEWORK

- Foundations of Computer Vision (Graduate)
- Machine Learning
- Numerical Methods
- Systems Programming and Software Tools
- Algorithm Design and Analysis
- Advanced (Multivariable) Calculus
- Linear Algebra
- Probability and Statistics

## COMMUNITY SERVICE

- University of Toronto University Physics Competition Preparation Session Speaker, 2015
- University of Toronto New College Move-in Volunteer 2013, 2014

## EXTRACURRICULAR EXPERIENCE

- Violin (15 years of study)
- CAP University Physics Prize Exam 2015, Competitor
- University of Toronto Hackathon 2013, Participant
- University of Toronto Skule Orchestra
  2012 – 2013 & 2013 – 2014, First Violin
- University of Toronto Intramural Table Tennis
  2012 – 2013, Participant
- Undergraduate Physics Competition 2012 – 2014,
  Competitor