

# Clement Fung

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Website: <https://clementfung.github.io/>

## SUMMARY

My current research interests include the security and privacy of distributed systems. Most notably, I am interested in distributed multi-party machine learning and corresponding attacks and defenses on these system. Lately, I am especially interested in the security and privacy issues surrounding Google's federated learning.

## PUBLICATIONS

### Non-refereed publications

- Muhammad Shayan, **Clement Fung**, Chris J.M. Yoon, Ivan Beschastnikh.  
*Biscotti: A Ledger for Private and Secure Peer-to-Peer Machine Learning*.  
arXiv November 2018.
- **Clement Fung**, Jamie Koerner, Stewart Grant, Ivan Beschastnikh.  
*Dancing in the Dark: Private Multi-Party Machine Learning in an Untrusted Setting*.  
arXiv November 2018.
- **Clement Fung**, Chris J.M. Yoon, Ivan Beschastnikh.  
*Mitigating Sybils in Federated Learning Poisoning*.  
arXiv August 2018.

## EDUCATION

### MSc, Computer Science

2016 - 2018

University of British Columbia, Vancouver, BC

Cumulative GPA: 88 / 100

#### Thesis:

- Dancing in the Dark: Private Multi-Party Machine Learning in an Untrusted Setting.  
Supervisor: Ivan Beschastnikh

#### Achievements:

- UBC CS Department Graduate Teaching Assistant Award, 2017
- UBC CS Department Student Service Award, 2017

#### Research Projects:

- Biscotti: A secure, private blockchain-based system for multi-party machine learning
- FoolsGold: A sybil-resilient federated learning protocol against model poisoning
- TorMentor: A system for distributed, collaborative, anonymous machine learning
- InsuLearn: A system for distributed learning on private medical data
- DistributedClocks: A library for vector clock instrumentation of distributed systems

#### Graduate Courses:

- CPSC 532R - Graphical Models (*Prof. Siamak Ravanbakhsh*)

- CPSC 540 - Advanced Machine Learning (*Prof. Mark Schmidt*)
- CPSC 538W - Data At Scale (*Prof. Andrew Warfield*)
- CPSC 538B - Distributed Systems (*Prof. Ivan Beschastnikh*)
- CPSC 536F - Algorithmic Game Theory (*Prof. Hu Fu*)
- CPSC 340 - Machine Learning (*Prof. Mark Schmidt*)

## **BASc, Honours, Systems Design Engineering**

2011 - 2016

*University of Waterloo, Waterloo, ON*

Cumulative GPA: 88 / 100

### Achievements:

- Sanford Fleming Award for Co-operative Proficiency - *Achievement in Co-op and Academics*
- Graduated with Dean's Honour's Distinction - *4x Dean's List*
- Dean's Honour's List, Winter 2016
- Dean's Honour's List, Winter 2013 - *Ranked 2nd / 81 students*
- Dean's Honour's List, Spring 2012 - *Ranked 2nd / 85 students*
- Dean's Honour's List, Fall 2011 - *Ranked 3rd / 94 students*

### Awards:

- W.W. King Exchange Fellowship, Winter 2015 - *\$500*
- President's International Experience Award, Winter 2014 - *\$1500*
- Sanford Fleming Award, Fall 2013, Outstanding Communication in Work Term Report - *\$300*
- Colonel Hugh Heasley Engineering Scholarship, Fall 2011 - *\$10000*
- University of Waterloo President's Scholarship of Distinction, Fall 2011 - *\$2000*

### Research Projects:

- Driven: A system for intelligent annotation and analysis of lane changes based on dashcam videos
- FridgeMate: A mobile application and intelligent image recognition system for annotation of food in refrigerators

## **TEACHING EXPERIENCE**

### **Teaching Assistant**

Sept 2016 - Dec 2018

*University of British Columbia*

- DSCI 571: Supervised Learning Fall 2018  
Instructor: Mikchael Gelbart, Varada Kolhatkar
- DSCI 523: Data Wrangling Fall 2018  
Instructor: Jenny Bryan, Rodolfo Lourenzutti
- CPSC 340: Machine Learning Winter 2018  
Instructor: Michael Gelbart
- CPSC 340: Machine Learning Fall 2017  
Instructor: Mark Schmidt
- CPSC 210: Software Construction Winter 2017  
Instructors: Norman Hutchinson, Paul Carter, Mehrdad Oveisi
- CPSC 210: Software Construction Fall 2016  
Instructors: Norman Hutchinson, Ryan Vogt, Jonatan Schroeder

## PROFESSIONAL EXPERIENCE

### Software Engineering Intern

January 2019 - present

*Oasis Labs, Berkeley, CA, USA*

- Working on an early stage privacy-preserving blockchain

### Software Engineering Intern

June - August 2015

*LinkedIn Corporation, Sunnyvale, CA, USA*

- Analytics: Building infrastructure for online relevance scoring at scale

### Software Engineering Intern

September 2014 - December 2014

*LinkedIn Corporation, Mountain View, CA, USA*

- Distributed Data Systems: Prototyped and designed new derived data serving system, Venice

### Software Engineering Intern

January 2014 - April 2014

*Voicebox Technologies, Bellevue, WA, USA*

- Server and Tools: Implemented layer for concurrent database access on a mobile service

### Software Developer

May 2013 - August 2013

*Ontario Institute for Cancer Research, Toronto, ON*

- Software developer in Paul Boutros' bioinformatics research group

### Software Developer

September 2012 - December 2012

*pVelocity, Toronto, ON*

### QA Analyst

January 2012 - April 2012

*pVelocity, Toronto, ON*