

AMIR TOOTOONI

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EDUCATION

Master of Science in Computer Science
The University of British Columbia, Vancouver

September 2020 - Present

Bachelor of Applied Science in Computer Engineering
The University of British Columbia, Vancouver

September 2016 - April 2020
4.33/4.33 GPA

RESEARCH EXPERIENCE

Linear Information Theory
UBC Department of Computer Science

May 2021 - Present

Have the pleasure and privilege of working with Prof. Joel Friedman as his research assistant. Currently we are working on a problem relating to coded caching in a context first introduced by Maddah-Ali and Niesen in their paper "Fundamental Limits of Caching".

Optimizing Aggregate Quality of Service with Sequential Jobs
UBC Department of Electrical and Computer Engineering

May 2019 - Sep 2019

Through the NSERC USRA, worked with Dr. Sathish Gopalakrishnan on an optimization problem in the context of real-time systems. We were able to design and prove the correctness of an optimization algorithm for a specific case of scheduling problems.

PUBLICATIONS

Sam Wiseman, Nima Saleh, Amir Tootooni, Parisa Eshraghi, Randy Jama, Sina Saleh, "Parathyroid identification during thyroid and parathyroid operations: A pilot study evaluating a novel low cost autofluorescence based device." (2021). *Am J Surg.* 2021 Jun;221(6):1150-1158. <https://doi.org/10.1016/j.amjsurg.2021.03.005>

TEACHING ASSISTANTSHIPS

CPSC 422 - Intelligent Systems
UBC Department of Computer Science

Jan 2021 - April 2021

This is a second course in AI offered by the CS department. Ran office hours on Zoom and marked assignments/exams.

CPSC 421 - Introduction to Theory of Computing
UBC Department of Computer Science

Sep 2020 - Dec 2020

First time working as a graduate teaching assistant. Due to COVID-19 the term was offered fully online, so had to run office hours remotely. Most my time was spent answering student questions on Piazza, writing homework and exam solutions in L^AT_EX, and marking.

CPEN 221 - Principles of Software Construction
UBC Department of Electrical and Computer Engineering

Sep 2019 - Dec 2019

My second time as a TA for this course. Primarily, ran labs, helped students with their assignments, and answered their questions in weekly office hours or online class discussion forums. Additionally, I helped design programming problems for programming proficiency tests. Even once lectured the class when the instructor was away.

CPSC 261 - Basics of Computer Systems

Jan 2019 - April 2019

UBC Department of Computer Science

Attended lab sections to help students with their assignments, held weekly office hours, and answered questions on Piazza. I also helped grade assignments and exams.

CPEN 221 - Principles of Software Construction

Sep 2018 - Dec 2018

UBC Department of Electrical and Computer Engineering

This was my first teaching assistantship at UBC. The course was about object-oriented programming, software testing, verification, abstraction and specification. My job was to attend labs and hold weekly office hours to help students with their assignments and exercises.

TECHNICAL COMPETENCIES

Programming	C, C++, Java, JavaScript, Python, R, MATLAB
Frameworks & Tools	Git, Flask, Express, L ^A T _E X, Gurobi, Jekyll
Prototyping Platforms	Arduino, Raspberry Pi, FPGA (with SystemVerilog)

AWARDS AND SCHOLARSHIPS

Graduate Teaching Assistant Award in The Department of Computer Science	<i>2020</i>
Huawei Scholarships in Computer Science	<i>2020</i>
Dean's Achievement Award in Engineering	<i>2019</i>
NSERC Undergraduate Student Research Award	<i>2019</i>
Trek Excellence Scholarship for Continuing Students	<i>2017, 2018, 2019</i>
Martin Sikes Memorial Scholarship in Electrical and Computer Engineering	<i>2018</i>
James Yan Award in Electrical and Computer Engineering	<i>2018</i>
Donald J. Evans Scholarship in Engineering	<i>2017</i>
SFU Faculty of Applied Science Excellence in Mathematics Award	<i>2016</i>

COURSE HIGHLIGHTS

CPSC 422 - Intelligent Systems	Fall 2018
<i>Top 3% of the class with a grade of 96%</i>	

Based on Artificial Intelligence by David Poole. Some topics covered were approximate inference in Bayesian networks, temporal inferences in Hidden Markov Models, modeling with Conditional Random Fields, and Probabilistic Relational Models. The course had a heavy emphasis on current research, and discussing relevant research papers was a common activity in class.

CPSC 340 - Machine Learning and Data Mining	Spring 2019
<i>Top 5% of the class with a grade of 98%</i>	

Cross-listed as CPSC 532M (a graduate introductory machine learning course), primarily based on Murphys Machine Learning: A Probabilistic Perspective. The course covered subjects ranging from clustering and regression to neural networks and automatic differentiation. Assignments required implementation of topics covered in class, while the examinations had a heavy emphasis on theory.

TECHNICAL PROJECTS

Autofluorescence Imaging for Parathyroid Identification	Sep 2019 - Jun 2020
<i>Senior Year Capstone Project</i>	<i>Python, OpenCV, Raspberry Pi</i>

Worked in a multidisciplinary group of computer, electrical, and biomedical engineers for my capstone project. Our goal was to design, implement, and test an economical medical product. The product

used the inherent autofluorescence of parathyroid glands to identify them during thyroidectomy. My focus was primarily on the software architecture and video processing side of the product, but advised with the hardware design as well. This project culminated in a study published in the Journal and American Surgery.

BarCoin

Junior Year Design Project

Jan 2019 - April 2019

JavaScript, Express, Pug.js, rambda, AWS, sha256

A blockchain based cryptocurrency used for ordering drinks. The design closely followed that of BitCoin and was hosted on a type T2 EC2 instance on AWS. A detailed explanation of BarCoin can be found [here](#).

Smartender

Junior Year Design Project

Jan 2019 - April 2019

Python, Raspberry Pi, Flask

An automated bartending machine controlled by a mobile application aimed to reduce lines at clubs and bars. Utilizes the aforementioned BarCoin cryptocurrency as a secure payment system. Designed and Built the device, programmed it to make drinks, and wrote an API for it to receive orders over a network. Github page of this project.

Polargraph Drawing Machine

Personal Project

Summer 2018

Adruino Uno, C++

Designed and constructed a drawing machine along with a drawing algorithm to take a picture and produce a corresponding single line drawing. The device functioned well and even drew sketches that were gifted to a close friend of mine.

PID Controller for Balancing a Ball

Personal Project

Summer 2018

Python, Raspberry Pi

Using an optical rotary encoder, a stepper motor, a Raspberry Pi 3, and a camera, a contraption was made that used a PID controller to balance a cue ball on a plank. One could gently hit the ball, but the controller would realign the plank so that the ball stayed on the ruler. This project had the primary purpose of making me comfortable with Python and a Linux environment.