

# Mohammad Taha Askari

PHD STUDENT · ELECTRICAL AND COMPUTER ENGINEERING, THE UNIVERSITY OF BRITISH COLUMBIA

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## Education

### PhD in Electrical & Computer Engineering

Vancouver, Canada

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT, THE UNIVERSITY OF BRITISH COLUMBIA (UBC)

Sep. 2022 - Present

- Advisor: Prof. Lutz Lampe

### M.A.Sc. in Electrical & Computer Engineering

Vancouver, Canada

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT, THE UNIVERSITY OF BRITISH COLUMBIA (UBC)

Sep. 2020 - Aug. 2022

- Cumulative GPA: 93.7 out of 100 (4.0/4.0) via 18 credits
- Advisor: Prof. Lutz Lampe

### B.Sc. in Electrical Engineering

Tehran, Iran

DEPARTMENT OF ELECTRICAL ENGINEERING, SHARIF UNIVERSITY OF TECHNOLOGY (SUT)

Sep. 2015 - Jul. 2020

- Cumulative GPA: 18.42 out of 20 (4.0/4.0) via 146 credits
- Advisor: Prof. Hamid Behroozi

## Research Interests

### Machine Learning in Communications

### Applications of Sequence Models in Communication Systems

### Information & Coding Theory

## Research Experience

### M.A.Sc. & PhD Thesis at Data Communications Group

ECE Department, UBC

RESEARCH ASSISTANT (SUPERVISOR: PROF. LUTZ LAMPE)

Sep. 2020 - Sep. 2026

- Studied probabilistic signal shaping methods, with a focus on probabilistic amplitude shaping for optical fiber communications.
- Introduced a low pass filter model to explain the interplay between probabilistic shaping and fiber nonlinearity.
- Suggested a new sequence selection scheme to improve nonlinearity tolerance in probabilistic amplitude shaping for optical fiber communications.
- Designed Bayesian phase search algorithm for carrier phase recovery in the low-SNR regime.
- Studied end-to-end sequence-based auto encoder approach for probabilistic shaping.

### Research Internship at Roche Canada

Greater Toronto Area, Canada

ALGORITHM R&D SOFTWARE ENGINEERING INTERN

Jun. 2024 - Oct. 2024

- Designed and implemented pipelines for feature extraction, dataset generation, and neural network training, enabling efficient anomaly detection in sequencing data.
- Developed and optimized weakly supervised neural network models, including a novel multi-label architecture for multi-class anomaly segmentation.
- Integrated interpretability and complexity analysis into the training workflow, delivering detailed reports and insights for model evaluation and enhancement.

## Publications and Posters

- M.T. Askari and L. Lampe, "Probabilistic Shaping for Nonlinearity Tolerance," Journal of Lightwave Technology. [Online Access]
- M.T. Askari and L. Lampe, "Perturbation-based Sequence Selection for Probabilistic Amplitude Shaping," 2024 European Conference on Optical Communication (ECOC). [Online Access]
- M.T. Askari and L. Lampe, "Bayesian Phase Search for Probabilistic Amplitude Shaping," 2023 European Conference on Optical Communication (ECOC). [Online Access]

- M.T. Askari, "Interplay between Fiber Nonlinearity and Probabilistic Amplitude Shaping," Master's Thesis, UBC [Online Access]
- M.T. Askari, L. Lampe, and J. Mitra, "Probabilistic Amplitude Shaping and Nonlinearity Tolerance: Analysis and Sequence Selection Method," Journal of Lightwave Technology. [Online Access]
- M.T. Askari, L. Lampe, and J. Mitra, "Nonlinearity Tolerant Shaping with Sequence Selection," 2022 European Conference on Optical Communication (ECOC) [Online Accrss]
- M.T. Askari, "Nonlinearity Tolerant Sequence Selection," Poster at 17<sup>th</sup> Canadian Workshop on Information Theory (CWIT)

Language Skills

English      Advanced  
Persian      Native

Relevant Courses

CPSC 436N-Natural Language Processing	95.0 out of 100	Dr. Schwartz	UBC	Winter1 2023
EECE 571D-Detection, Estimation, and Learning	98.0 out of 100	Dr. Lampe	UBC	Winter2 2021
EECE 562-Statistical Signal Processing	90.0 out of 100	Dr. Wang	UBC	Winter1 2021
CPSC 540-Advanced Machine Learning	96.0 out of 100	Dr. Schmidt	UBC	Winter2 2020
CPSC 340-Machine Learning & Data Mining	100 out of 100	Dr. Wood	UBC	Winter1 2020
EECE 565-Communication Networks	95.0 out of 100	Dr. Wong	UBC	Winter1 2020
Introduction to Machine Learning	18.0 out of 20	Dr. Mohammadzade	SUT	Spring 2019
Information & Coding Theory	18.7 out of 20	Dr. Mirmohseni	SUT	Fall 2018

Software Proficiency

Programming    Python, Matlab, R, Git version control, SQL, Julia, C/C++.

Teaching Experience

Teaching Assistant	STAT 251-Elementary Statistics	Dr. Premarathna	UBC	Winter2 2024
Teaching Assistant	STAT 200-Elementary Statistics for Applications	Dr. Lourenzutti	UBC	Winter1 2023
Teaching Assistant	ELEC 221-Signals & Systems	Dr. Thrampoulidis	UBC	Winter1 2023
Teaching Assistant	STAT 200-Elementary Statistics for Applications	Dr. Burr	UBC	Summer1 2023
Teaching Assistant	STAT 251-Elementary Statistics	Dr. Premarathna	UBC	Winter2 2022
Teaching Assistant	ELEC 221-Signals & Systems	Dr. Di Matteo	UBC	Winter1 2022
Teaching Assistant	STAT 200-Elementary Statistics for Applications	Dr. Burr	UBC	Winter1 2022
Teaching Assistant	CPSC 330-Applied Machine Learning	Dr. Oveisi	UBC	Summer1 2022
Teaching Assistant	STAT 306-Finding Relationships in Data	Dr. Premarathna	UBC	Winter1 2021
Teaching Assistant	CPSC 303-Numerical Approximation	Dr. Yi	UBC	Winter2 2020

Voluntary Experience

ECE Graduate Student Association (ECEGSA) ECE Department, UBC  
VP ACADEMIC Apr. 2024-Present

- Organized academic and professional development events, including resume workshops, career fairs, and lightning talks, to support students' career advancement and academic success.
- Facilitated opportunities for graduate students to build their professional brand and network with industry professionals and academic peers.

Online Instructional Skills Workshop CIRTL, UBC  
PARTICIPANT Jan. 2021

- Practiced developing online lesson plans and using techniques to involve students actively in the online learning process.
- Taught three lessons to employ new teaching techniques.

## Conference on “Emerging Technologies for Electric Vehicles and Smart Cars”

EE Department, SUT

### ADMINISTRATIVE HEAD

Nov. 2018

- Directed a team of ten students in holding the conference.
- Gained knowledge and experience in several managerial skills like apportioning responsibilities and group management.

## International Biology Olympiad

Tehran, Iran

### TEAM GUIDE

Jul. 2018

- Guided Czech Republic's delegation in the 29<sup>th</sup> International Biology Olympiad (IBO).
- Acquired experience in the communication skills required for accompanying the delegation.
- Awarded certification from the IBO committee.

## Honors & Awards

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**Nominated for UBC Four Year Doctoral Fellowship** with an amount of \$18,200 per year.

2023

**Awarded UBC 2021 M.A.Sc. Graduate Student Initiative (GSI)** with an amount of \$5,000.

2021

**Member of the National Elites Foundation** by being in the best ranks of the University entrance exam.

2015-Present

## Selected Course Projects

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### COVID-19 Detection: A Combination of Transformer Models with Image Augmentation Methods

Winter 2020

COURSE: ADVANCED MACHINE LEARNING

UBC

- Studied methods for generating synthetic X-ray images to improve the accuracy of COVID-19 detection models and implemented GAN and VAE to augment data.
- Applied transformer models to COVID-19 classification based on chest X-ray images.
- Supervisor: Dr. Schmidt

### Trajectory Prediction

Winter 2020

COURSE: MACHINE LEARNING & DATA MINING

UBC

- Studied methods for autonomous driving trajectory prediction and implemented a chained neural network model.
- Supervisor: Dr. Wood

### COVID-19 Deaths Prediction

Winter 2020

COURSE: MACHINE LEARNING & DATA MINING

UBC

- Studied algorithms for time-series regression and implemented linear auto-regressive model.
- Supervisor: Dr. Wood