

# Nourhan Bayasi PhD Student and Vanier Scholar at UBC

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## ACADEMIC EDUCATION

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### PhD in Electrical and Computer Engineering

January 2020 – April 2025

**University of British Columbia (UBC)**, Vancouver, Canada

Thesis: Learning Continually Under Changing Data Distributions

CGPA: 94.1%

### Master of Science in Electrical and Computer Engineering

September 2013 – April 2015

**Khalifa University (KU)**, Abu Dhabi, United Arab Emirates

CGPA: 3.7/4

### Bachelor of Science in Communication Engineering

September 2009 – April 2013

**Khalifa University (KU)**, Sharjah, United Arab Emirates

CGPA: 3.96/4

## VOCATIONAL EDUCATION

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### Northern Council for Further Education (NCFE)

2017 – 2018

Level 3 Award in Assessing Vocationally Related Achievement, funded by Higher Colleges of Technology (HCT)

## WORK EXPERIENCE

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### Machine Learning Engineer Intern

April 2024 – October 2024

**Cognia AI**, Vancouver, Canada

- Developed and implemented algorithms for fairness and bias mitigation, ensuring ethical and equitable outcomes in machine learning models.
- Enhanced continual learning frameworks by improving systems that adapt and learn from new data, maintaining model robustness in dynamic environments.
- Promoted trustworthy AI practices through collaboration on projects that increased transparency, accountability, and reliability of AI systems, aligning with industry standards for ethical AI development.

### Teaching Assistant

September 2020 – August 2024

**University of British Columbia (UBC)**, Vancouver, Canada

- Assessed and graded exams, quizzes, assignments, lab reports, and project reports under the guidance of the course professor.
- Organized the setup of lab equipment for seamless execution of lab sections as per course requirements.
- Delivered effective supervision and instruction to students during lab sections, tutorial sessions, and office hours, following the directives of the course professor.

### Graduate Academic Assistant

June 2020 – August 2020

**University of British Columbia (UBC)**, Vancouver, Canada

- Facilitated professor's transition to online teaching by designing a comprehensive course blueprint.
- Implemented a seamless blend of asynchronous and synchronous learning, selecting and integrating suitable tools for optimal course delivery.
- Prepared and organized presentation slides to enhance online teaching effectiveness.
- redesigned assessments to introduce flexibility and adapt to the online learning environment.

### Lab Instructor, Electrical Engineering Department

August 2018 – December 2019

**Higher Colleges of Technology (HCT)**, Sharjah, United Arab Emirates

- Contributed to the development of labs and provided essential support for students in utilizing laboratory machinery, tools, and equipment.
- Assisted students in the resourcing and implementation phase of various student projects.
- Engaged with students in Science Fairs and Emirates Skill Competition (secured top-three placements six times).
- Managed the reception, installation, and maintenance of laboratory equipment and supplies.
- Implemented a preventative maintenance schedule for equipment, maintaining comprehensive manuals and logs.

- Demonstrated the proper use of machines, tools, and equipment within the lab.
- Oversaw consumable materials inventory, ensuring adequate stock levels for supplies.
- Established and maintained systems for tracking borrowed equipment and tools.
- Reinforced safety protocols and housekeeping procedures within the laboratory.
- Taught various labs, including Digital Circuits, Electrical Circuits, Electronics I, Electronics II, PCB, Communication Systems, SDP, etc.

#### **Instructor, Technical Studies Program (Vocational Program)**

*August 2017 – July 2018*

##### **Higher Colleges of Technology (HCT), Sharjah, United Arab Emirates**

- Led curriculum development efforts, planning, designing, and developing training materials and assessment instruments compliant with NCFE and EAL requirements.
- Conducted thorough needs assessments to identify learner needs, crafted effective learning options to address them.
- Delivered high-standard training aligned with qualification specifications, ensuring learners achieved defined learning outcomes.
- Utilized a variety of training aids and resources tailored to suit learner needs.
- Planned and executed assessment activities in accordance with program standards.
- Updated training curriculum based on feedback and evolving business needs, including preparation of materials and training rooms for workshops.
- Tailored workshop resources to accommodate learners with diverse backgrounds, learning styles, and special needs.

#### **Workshop Engineer, Electrical Engineering Department**

*September 2015 – July 2017*

##### **Institute of Applied Technology (IAT), Umm Al Quwain, United Arab Emirates**

- Played a pivotal role in students' graduation projects, actively engaging in the entire process from planning to implementation.
- Participated in Science Fairs (won first prize four times).
- Assisted course instructor in developing and implementing teaching modules and projects.
- Contributed to the development of labs and provided essential support for students in utilizing laboratory machinery, tools, and equipment.
- Managed the reception, installation, and maintenance of laboratory equipment and supplies.

### TECHNICAL SKILLS

#### **Software Programming**

- Python
- Matlab
- C++

#### **Hardware Programming**

- Synopsys Custom Flow
- Verilog
- SystemVerilog

#### **Simulation**

- Tinkercad
- Multisim
- Simulink

### HONORS AND AWARDS

- **Runner-Up, Women in MICCAI (WiM) Best Oral Presentation Award**, BiasPruner's MICCAI Paper 2024
- **Winner, Women in MICCAI (WiM) Best Health Equity Paper Award**, BiasPruner's MICCAI Paper 2024
- **Shortlisted for MICCAI Best Paper Award and MICCAI Young Scientist**, BiasPruner's MICCAI Paper 2024
- **Borealis AI Global Fellowship**, RBC's AI Research Institute: Borealis 2024
- **Society Registration Grant**, @MICCAI Conference 2024
- **Best Paper Award**, ISIC Medical Image Analysis Workshop @MICCAI Conference 2023
- **Best Paper Award**, ISIC Medical Image Analysis Workshop @ECCV Conference 2022
- **Vanier Scholarship**, Canada's most prestigious PhD scholarship (**Ranked Top 1**) 2022 – 2025
- **Four Year Fellowship (4YF) for PhD**, UBC 2022 – 2026
- **Dr. and Mrs. Brandwajn Graduate Award in Electrical and Computer Engineering**, UBC 2021
- **Faculty of Applied Science Graduate Award**, UBC 2021
- **President's Academic Excellence Initiative PhD Award**, UBC 2021
- **Travel Award**, Recipient of MICCAI Student Travel Grant 2021
- **International Student Award**, UBC 2020 – 2022
- **Scholarship Award, PhD Studies**, UBC 2020 – 2023
- **Best Paper Award**, IEEE Transactions on Very Large-Scale Integration Systems 2016
- **Best Prototype Award, 2nd Place**, Engineering Student Renewable Energy Competition @UAE University 2013
- **Best Poster Award, 1st Place**, Undergraduate Research Conference on Applied Computing @Zayed University 2013
- **Leadership Award, Best Student Category**, KU 2013
- **Scholarship Award, Master Studies**, KU 2013 – 2015
- **President List Award**, College of Engineering, KU 2009 – 2013

## **SELECTED PUBLICATIONS**

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### **JOURNALS**

- **Nourhan Bayasi**, Ghassan Hamarneh, Rafeef Garbi (2024). GC<sup>2</sup>: Generalizable Continual Classification of Medical Images. IEEE Transactions on Medical Imaging (**TMI**).
- **Nourhan Bayasi**, Temesghen Tekeste, Hani Saleh, Ahsan H. Khandoker, Baker Mohammad, Mohammed Ismail. (2019). A Novel Algorithm for the Prediction and Detection of Ventricular Arrhythmia. Analog Integrated Circuits and Signal Processing (Springer). PP 413–426.
- **Nourhan Bayasi**, Temesghen Tekeste, Hani Saleh, Baker Mohammad, Ahsan Khandoker, Mohammed Ismail. (2015). Low-power ECG-based Processor for Predicting Ventricular Arrhythmia. IEEE Transactions on Very Large-Scale Integration Systems (**VLSI**). 24(5): 1962-1974 [**Best Paper Award**]

### **CONFERENCE PAPERS**

- **Nourhan Bayasi**, Jamil Fayyad, Ghassan Hamarneh, Rafeef Garbi. (2024). BiasPruner: Debaised Continual Learning for Medical Image Classification. In proceedings of Medical Image Computing and Computer Assisted Intervention (**MICCAI**). [**Early Accept**] [**Oral**]
- **Nourhan Bayasi**, Ghassan Hamarneh, Rafeef Garbi. (2024). Continual-Zoo: Leveraging Zoo Models for Continual Classification of Medical Images. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**) CLVISION Workshop. Accepted.
- **Nourhan Bayasi**, Siyi Du, Ghassan Hamarneh, Rafeef Garbi. (2023). Continual-GEN: Continual Group Ensembling for Domain-agnostic Skin Lesion Classification. @ISIC Medical Image Analysis Workshop, MICCAI. proceedings of the International Conference on Medical Image Computing and Computer Assisted Intervention (**MICCAI**) Workshop (Eighth ISIC Skin Image Analysis).
- Siyi Du, **Nourhan Bayasi**, Ghassan Hamarneh, Rafeef Garbi. (2023). AViT: Adapting Vision Transformers for Small Skin Lesion Segmentation Datasets. In proceedings of the International Conference on Medical Image Computing and Computer Assisted Intervention (**MICCAI**) Workshop (Eighth ISIC Skin Image Analysis) [**Best Paper Award**]
- Siyi Du, **Nourhan Bayasi**, Ghassan Hamarneh, Rafeef Garbi. (2023). MDViT: Multi-domain Vision Transformer for Small Medical Image Segmentation Datasets. In proceedings of the International Conference on Medical Image Computing and Computer Assisted Intervention (**MICCAI**).
- Siyi Du, Ben Hers, **Nourhan Bayasi**, Ghassan Hamarneh, Rafeef Garbi. (2022). FairDisCo: Fairer AI in Dermatology via Disentanglement Contrastive Learning. In proceedings of European Conference on Computer Vision (**ECCV**) Workshops. [**Best Paper Award**]
- **Nourhan Bayasi**, Ghassan Hamarneh, Rafeef Garbi. (2022). BoosterNet: Improving Domain Generalization of Deep Neural Nets Using Culpability-Ranked Features. In Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (**CVPR**).
- **Nourhan Bayasi**, Ghassan Hamarneh, Rafeef Garbi. (2021). Culprit-Prune-Net: Efficient Continual Sequential Multi-Domain Learning with Application to Skin Lesion Classification. In proceedings of Medical Image Computing and Computer Assisted Intervention (**MICCAI**). [**Early Accept**]
- Temesghen Tekeste, **Nourhan Bayasi**, Hani Saleh, Ahsan Khandoker, Baker Mohammad, Mahmoud Al-Qutayri, Mohammed Ismail. (2015). Adaptive ECG Interval Extraction. In proceedings of IEEE International Symposium on Circuits and Systems (**ISCAS**).
- **Nourhan Bayasi**, Temesghen Tekeste, Hani Saleh, Baker Mohammad, Mohammed Ismail. (2015). A 65-nm Low Power ECG Feature Extraction System. In proceedings of IEEE International Symposium on Circuits and Systems (**ISCAS**).
- **Nourhan Bayasi**, Hani Saleh, Baker Mohammad, Mohammed Ismail. (2014). 65-nm ASIC Implementation of QRS Detector based on Pan and Tompkins Algorithm. In proceedings of the International Conference on Innovations in Information Technology (**IIT**).
- **Nourhan Bayasi**, Temesghen Tekeste, Hani Saleh, Ahsan Khandoker, Baker Mohammad, Mohammed Ismail. (2014). Adaptive Technique for P and T Wave Delineation in Electrocardiogram Signals. In the 36th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (**EMBS**).
- **Nourhan Bayasi**, Hani Saleh, Baker Mohammad, Mohammed Ismail. (2013). The Revolution of Glucose Monitoring Methods and Systems: A Survey. In the IEEE 20th International Conference on Electronics, Circuits, and Systems (**ICECS**).

## **BOOK CHAPTERS**

- Hani Saleh, **Nourhan Bayasi**, Baker Mohammad, Mohammed Ismail. (2018). Self-powered SoC Platform for Analysis and Prediction of Cardiac Arrhythmias. Springer.
- Mohammad Alhawari, Dima Kilani, Temesghen Habte, Yonatan Kifle, **Nourhan Bayasi**, Nicholas Halfors, Baker Mohammad, Hani Saleh, Mohammed Ismail. (2019). Self-Powered SoC Platform for Wearable Health Care. The IoT Physical Layer. Springer.

## **US PATENTS**

- **Nourhan Bayasi**, Temesghen Habte, Hani Saleh, Ahsan Khandoker, Mohammed Ismail. (2020). Medical Device and Method for Detecting a Ventricular Arrhythmia Event. United States. Patent no. 10548499. Issued.
- Temesghen Habte, **Nourhan Bayasi**, Hani Saleh, Ahsan Khandoker, Baker Mohammad, Mahmoud Al-Qutayri, Mohammed Ismail. (2019). Medical Device having Automated ECG Feature Extraction. United States. Patent no. 10194821. Issued.
- **Nourhan Bayasi**, Temesghen Habte, Hani Saleh, Ahsan Khandoker, Mohammed Ismail. (2017). Medical Device for Detecting a Ventricular Arrhythmia Event. United States. Patent no. 9717438. Issued.

## **OTHER ACTIVITIES**

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| • <b>Conference Reviewer &amp; Emergency Reviewer</b> , IEEE WACV                                | 2024        |
| • <b>Program Committee &amp; Reviewer</b> , ISIC Medical Image Analysis Workshop @MICCAI         | 2023 – 2024 |
| • <b>Journal Reviewer</b> , Artificial Intelligence in Medicine                                  | 2022 – 2023 |
| • <b>Journal Reviewer</b> , Computerized Medical Imaging and Graphics                            | 2022 – 2023 |
| • <b>Electronics Expert</b> , Emirates Skills National Competition, UAE                          | 2017        |
| • <b>Standard Leader</b> , AdvancED Academic Accreditation, Institute of Applied Technology, UAE | 2016        |
| • <b>STEAM Program Developer</b> , Engineering, Institute of Applied Technology, UAE             | 2016        |
| • <b>Chairman</b> , IEEE Khalifa University Student Branch                                       | 2010        |

## **PERSONAL INFORMATION**

- Nationality: Canadian
- DOB 1992-JAN-15