

Education

University of Toronto

PhD Candidate in Medical Biophysics

- **Awards:** Canada Graduate Scholarships-Master's (Sept. 2022), Vector Scholarship in Artificial Intelligence (Sept. 2022)

Year 1, expected May 2027

Cumulative GPA: 4.00 (A+)

University of British Columbia

BASc Electrical-Biomedical Engineering, Minor in Physics

- **Awards:** Charles Lindsay Thompson Scholarship (Feb. 2022), Jim and Helen Hill Memorial Service Award in Electrical Engineering (Feb. 2020), Trek Excellence Scholarship for top 5% standing in faculty (Sept. 2018, 2019, 2021, 2022)

Graduated May 2022

Cumulative GPA: 3.92 (A+)

Skills

Languages: Python, JavaScript/TypeScript, C, SQL, MATLAB

Deep Learning: PyTorch, Keras/TensorFlow, scikit-learn, Pandas

Tools and Frameworks: Git, Linux, Docker, AWS, React, HPC

Experiences

Computational Scientist Intern - Think Tank Team

Samsung Research America

June 2022 - September 2022

Mountain View, CA

- Ideated, researched, and designed experiments to push the frontier of Samsung technology (<https://thinktankteam.info/>)
- Learned and implemented efficient signal processing, computer vision detection and Simultaneous Localization and Mapping (SLAM) algorithms as proof of concept for possible new products using **Python**

Software Development Engineering Intern

Amazon Canada

June 2021 - August 2021

Vancouver, BC

- Designed and built an operational dashboard to **consolidate** and **securely manage** team workflows and system performance
- Created and deployed solution using **AWS Services** including: Lambda Step Functions, CDK, DynamoDB, S3, CloudFront
- Created an authenticated UI using **React/TypeScript**, infrastructure code using **AWS CDK in TypeScript**, and implemented security measures using **AWS Cognito** to properly secure access of confidential data

Machine Learning Engineering Intern

Flex Artificial Intelligence Inc.

May 2020 - January 2021

Vancouver, BC (Remote)

- Developed an end to end patented **computer vision pipeline** to detect fine-grained form errors in real world exercise videos, such as raising toes during deadlift, to provide insight on a user's exercise performance
- Researched and implemented cutting-edge approaches to **3D video data**, including: 3D pose detection, spatio-temporal attention, self-supervised temporal alignment, 3D deformable convolutions, and triplet models for anomaly detection
- **Improved frame-level error classification accuracy by 17.3%** with fully completed pipeline

Summer Research Student

Sunnybrook Research Institute - Physical Sciences

May 2019 - August 2019

Toronto, ON

- Used deep learning and computer vision techniques to analyse digitized breast cancer whole-slide images for cancer detection and classification with **PyTorch**
- Achieved **91% accuracy** on slide-level segmentation task by innovating cancer detection pipeline, model **obtained 3rd place** on 470-participant breast histology competition: BreastPathQ

Publications

- O. Ciga, **T. Xu**, S. Nofech-Mozes, S. Noy, F.-I. Lu, and A. L. Martel, "Overcoming the limitations of patch-based learning to detect cancer in whole slide images," *Scientific Reports*, vol. 11, no. 1, 2021.
- O. Ciga, **T. Xu**, and A. L. Martel, "Self supervised contrastive learning for digital histopathology," *Machine Learning with Applications*, vol. 7, p. 100198, 2022.

Project Highlights

SemiCOL Challenge <https://www.semicol.org/>

February 2023 - June 2023

- **2nd place** on arms 1 and 2 in SemiCOL: a challenge on using semi-supervised learning for colorectal cancer detection
- **Presented algorithm** at ECDP 2023: the 19th European Congress on Digital Pathology
- Created efficient **tissue segmentation pipeline** using an ensemble of UNet and UNETR models respectively using PAWS and DINO **semi** and **self-supervised** pretrained ResNet50 and Vision Transformer encoders