Jillian Cardinell

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Mississauga, ON, Canada

Education

McGill University: Master's of Electrical Engineering, MSc Sept 2020 – Present

- CGPA: 4.0/4.0

Ryerson University: Bachelor of Biomedical Engineering, BEng Sept 2016 – April 2020

- CGPA: 3.98/4.0 (4.24/4.33)

Awards & Recognitions:

- NSERC Undergraduate Student Research Award ($4500) 2018 and 2019
- Hurvitz Brain Sciences Summer Student Research Award ($3200) 2019
- Siyam Scholarship for Woman in Engineering, Faculty-Wide ($6000) 2018
- Undergraduate Biomedical Engineering Academic Excellence Award ($1000) 2018
- Ontario Professional Engineers Foundation Entrance Scholarship ($2500) 2016
- Renewable Entrance Scholarship ($4000/year) 2016-2020
- Dean's List 2016-2021

Experience

Probabilistic Vision Group:
Master's Student, McGill University Sept 2020-Present
Accounting for Biases in Aggregated Medical Datasets:

- Develop a variety of conditional instance normalization methods to adapt 3D neural networks to differences between Multiple Sclerosis clinical trial datasets
- Design experiments to evaluate and isolate the source of bias between datasets
- Utilise a private PyTorch Ignite-based pipeline for conducting experiments

Maternal Fetal Imaging Lab:
Manuscript Editor, Ryerson University Sept 2021-Present

- Edit graduate student manuscripts to prepare for publication
- Provide tutorials and constructive feedback

Research Assistant, Ryerson University Sept 2019-Sept 2020
Automated Data Augmentation:

- Developed a system to automatically select a data augmentation policy for medical volumetric data that will optimize the performance of a deep neural network
- Evaluated various black box optimization algorithms
- Experimented with 3D deep neural networks in PyTorch with BraTS and other internal datasets

Biophotonics and Bioengineering Laboratory:
Research Assistant, Sunnybrook Research Institute Sept 2017-Sept 2019
Retinal Imaging Study:

- Developed MATLAB toolbox for retinal optical coherence tomography angiography (OCTA) images to extract quantitative vascular biomarkers related to mental disorders

Hereditary Hemorrhagic Telangiectasia Lesion Study:

- Generated MATLAB scripts for the processing and quantitative analysis of OCTA images of arteriovenous malformations to characterize lesions and identify changes throughout treatment

Augmented Reality (AR) Study:

- Used Microsoft Hololens to overlay 3D virtual medical models generated from CT or MRI scans onto patients in the operating room
- Created MATLAB scripts to measure the registration accuracy between patient anatomy and the AR overlay

Skills

Programming: Python (PyTorch, PyTorch Ignite), MATLAB, C++, C
Operating Systems: Windows 7+, Linux (Mint, Ubuntu), Windows Subsystem for Linux (WSL)
Soft Skills: Scientific communication (written, verbal, & visual), collaboration, time-management, adaptability

Publications

Journals:

[1] **J. Cardinell**, J. Ramjist, C. Chen, W. Shi, N. Nguyen, T. Yeretsian, M. Choi, D. Chen, D. Clark, A. Curtis, M. Faughnan, V. Yang, and the Brain Vascular Malformation Consortium HHT Investigator Group, "Quantification metrics for telangiectasia using optical coherence tomography," *Scientific Reports*. vol 12, no. 1. Feb. 2022.

[2] J. Lo, **J. Cardinell**, A. Costanzo, and D. Sussman. "Medical Augmentation (Med-Aug) for Optimal Data Augmentation in Medical Deep Learning Networks," *Sensors*. vol 21. Oct. 2021

[3] J. Lo, S. Nithiyanantham, **J. Cardinell**, D. Young, S. Cho, A. Kirubarajan, M. W. Wagner, R. Azma, S. Miller, M. Seed, B. Ertl-Wagner, and D. Sussman. "Cross Attention Squeeze Excitation Network (CASE-Net) for Whole Body Fetal MRI Segmentation," *Sensors*. vol 21. no. 13. June 2021.

[4] N.Q. Nguyen, **J. Cardinell**, J. Ramjist, P. Lai, Y. Dobashi, D. Guha, D. Androutsos, and V. Yang, "An Augmented Reality System Characterization of Placement Accuracy in Neurosurgery," *Journal of Clinical Neuroscience*. Dec. 2019.

[5] C. Pasarikovski, G. Waggass, **J. Cardinell**, P. Howard, L. da Costa, and V. Yang, "Pipeline embolization device with shield technology for the treatment of ruptured intracranial aneurysm," *The Neuroradiology Journal*. vol 32, no. 3, pp. 189-192. Jun. 2019.

Conferences and Presentations:

[1] B. Nichyporuk, **J. Cardinell**, J. Szeto, R. Mehta, S. Tsaftaris, D. L. Arnold, and T. Arbel. "Cohort Bias Adaptation in Aggregated Datasets for Lesion Segmentation," *Domain Adaptation and Representation Transfer Workshop at the 2021 International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI)*.

[2] B. Nichyporuk, K. Vasilevski, A. Hu, C. Myers-Colet, **J. Cardinell**, J. Szeto, J.P. Falet, E. Zimmermann, J. Schroeter, D. L. Arnold, and T. Arbel. "Consensus Learning with Multi-Rater Labels for Segmenting and Detecting New Lesions," *MSSEG-2 challenge proceedings: Multiple sclerosis new lesions segmentation challenge using a data management and processing infrastructure*.

[3] N.Q. Nguyen, **J. Cardinell**, J. Ramjist, Y. Dobashi, D. Androutsos, and V. Yang, "Augmented reality systems for improved operating room workflow," *Neurosurgery*. vol. 66, pp. nyz310_414. Aug. 2019.

[4] **J. Cardinell**, W. Shi, J. Ramjist, N.Q. Nguyen, D.S. Clark, A. Curtis, H. Jakubovic, D.S.A. Marchuk, P. Marambaud, H. Kim, M.L. Lawton, N. Vozoris, M.E. Faughnan, and V. Yang, "Structural and angiographic optical coherence tomography for quantitative analysis of hereditary hemorrhagic telangiectasia skin lesions: Preliminary Findings", *Presented at 13th HHT International Scientific Conference,* Puerto Rico, USA. Jun. 2019.