

Matthew Ng

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📧: scholar.google.ca/citations?user=1PbPBcwAAAAJ&hl=en

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SKILLS

- **Research:** Deep learning, computer vision, Bayesian inference
- **Programming Languages:** Python, C#, TypeScript/JavaScript, Java, MATLAB, C/C++, R
- **Python Packages:** PyTorch, TensorFlow, numpy, scikit-learn, pandas, matplotlib, openCV
- **Tools:** Git, Docker, Bash scripting, Google Cloud Platform

EXPERIENCE

Software Engineer, Machine Learning, International Medical Solutions Inc. May 2020 - Present

- Built several demos for prospective clients: Federated Learning for Chest X-ray Classification; Lung Opacity Detection; Prostate MRI Segmentation
- Developed and deployed a deep learning model for hip joint segmentation with human-level accuracy
- Implemented a monitoring application to measure model accuracy in production environment

Research Assistant, Sunnybrook Research Institute May 2017 - Apr 2020

- Compared algorithms for learning Bayesian Neural Networks for cardiac MRI segmentation
- Examined the use of uncertainty estimates from neural networks to flag potentially inaccurate segmentation
- Explored an alternative method of segmentation by predicting contour points on the edge of the object instead of performing pixel-wise classification (Curve-GCN)

Software Engineering Intern, Conavi Medical Inc. May 2015 - Aug 2016

- Designed and developed embedded firmware to control an ultrasound pulsing system
- Developed various image acquisition controllers and user interface components

EDUCATION

MSc, Department of Medical Biophysics, University of Toronto Sept 2017 - Apr 2020

Thesis: Estimating Uncertainty in Neural Networks for Segmentation Quality Control

BASc, Engineering Science, University of Toronto Sept 2012 - Apr 2017

SELECTED PUBLICATIONS

- [1] J. Ma, J. Chen, **M. Ng**, R. Huang, Y. Li, C. Li, X. Yang, A. L. Martel. Loss odyssey in medical image segmentation. *Medical Image Analysis*, 102035.
- [2] F. Guo, **M. Ng**, M. Goubran, S. Petersen, S. Piechnik, S. Neubauer, G. Wright. Improving Cardiac MRI Convolutional Neural Network Segmentation on Small Training Datasets and Dataset Shift: A Continuous Kernel Cut Approach. *Medical Image Analysis*, 101636.
- [3] **M. Ng**, F. Guo, L. Biswas, G. A. Wright. Estimating Uncertainty in Neural Networks for Segmentation Quality Control. *Medical Imaging meets NeurIPS Workshop (Oral)*, Montréal, Canada, 2018.

OTHER PROJECTS

Predicting Patient Outcomes from Electronic Health Records (TDot Health Hackathon) October 2019

- Compared different machine learning algorithms to predict mortality from patient demographics, lab tests and vital signs (SVM, Decision Tree); visualized the most important features in the SVM

Wireless Electrodes for Intraoperative Neuromonitoring March 2017

- Prototyped a wireless electrode system to replace wired system being used at the Hospital for Sick Children
- Interfaced Arduino with ADCs, DACs, and Bluetooth modules for wireless data transfer