Richard Abrich

B.A.Sc., M.A.Sc. Computer Engineering
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EDUCATION

M.A.Sc. Electrical & Computer Engineering **2011 - 2013**
University of Toronto *Toronto ON*

Thesis: Computational Techniques for Detecting Coronary Atherosclerosis
Computer vision, medical image processing, machine learning
GPA: 3.96/4.0 (cumulative)

B.A.Sc. Electrical & Computer Engineering **2006 - 2011**
University of Toronto *Toronto ON*

Thesis: Real-time Simulation of Ultrasound Fields with CUDA
General Purpose GPU programming, 3D graphics
Award: 1st Place Software Design

SKILLS

Languages English (native), French (fluent)
Coding Python, JavaScript/TypeScript, R, C/C++, Java, C#, PHP, MATLAB, Scala, VBA, SQL, HTML/CSS, LaTeX

PROFESSIONAL EXPERIENCE

Principal Consultant **May 2018 - Present**
MLDSAI Inc. *Toronto ON, Miami FL*

- Advised clients with $billions in revenue and thousands of employees on product, technology, and hiring
- Raised $millions in funding, interviewed hundreds of customers, led technical & business teams of 12+
- Designed and implemented custom state-of-the-art full-stack machine learning applications, including:

Cleveland Clinic Innovations: Neurological disorder assessment with eye-tracking Transformers (PyTorch)
Atomic.vc: Automatic software testing with Large Language Models (OpenAI)
OpenAdapt.AI: **World's first** open-source AI-First Process Automation system (HuggingFace, OpenAI)
Headspace: Content recommendation with Recurrent Neural Networks (PySpark, Theano)
American Family Insurance: Human-in-the-loop insurance estimation with Multimodal Learning (**$20M yearly savings**)

Machine Learning Scientist **Jun 2018 - Jul 2019**
Arterys *Toronto ON, San Francisco CA*

- Created state-of-the-art deep neural networks for medical image segmentation & classification (Keras, TensorFlow)
- Implemented reusable components for building and testing large scale distributed deep learning systems (Kubernetes)

Machine Learning R&D Engineer **Jan 2015 - Oct 2016**
Kindred Systems *Toronto ON, San Francisco CA*

- Designed and implemented libraries and tools for creating distributed robotics systems
  - Audio/video encoding/decoding/multiplexing
  - Data storage/retrieval/visualization/annotation
  - Distributed messaging/model training
  - Speech recognition
  - Visual object detection
  - Virtual reality UI/UX (Unity3D)
- Designed and conducted experiments in time series classification and forecasting with deep recurrent neural networks
- Summarized and implemented research papers in computer vision, deep learning and reinforcement learning

Core Software Engineer **Jul 2013 - Dec 2014**
RBC Capital Markets *Toronto ON, Sydney AUS*

- Designed, implemented, tested, and documented applications and libraries for global use (Java, Python)

• Profit & Loss reconciliation • Extract/Transform/Load (ETL) • Web service auth • Object/Relational Mapping

Software Developer (Contractor) **2009 - 2013**
Toronto General Hospital *Toronto ON*

– Designed/implemented applications to automate billing, track metrics, and reformat clinical documents (JavaScript)
– Eliminated user errors and "saved over 200 personnel hours per year" through automation

AWARDS

Best of 2020, Information Systems Security Association Journal	2020
1st Place Rotman Entrepreneurship and Venture Capital Association Hackathon ($24,000)	2013
Y Combinator Startup School invitee	2013
Highest Fruit Prize for Best Innovation, Women's College Hospital, Hacking Health Toronto	2013
Mitacs Accelerate research grant ($15,000)	2012
1st Place Orbis Software Design Grant ($4,000)	2011
Department of Electrical & Computer Engineering Outstanding Project Award	2011
University of Toronto Arbor Scholar (National Scholar Finalist) ($15,000)	2006
Bank of Nova Scotia Scholarship for Mathematics ($1,000)	2006

PUBLICATIONS

- Abrich, R., Chan, G. S. (2020) Privacy Preserving Contact Tracing. *Information Systems Security Association Journal.*
- Abrich, R., Paul, N., Wong, W. (2014) Computational Techniques for Detecting and Characterizing Coronary Atherosclerosis. *Society of Thoracic Radiology Annual Meeting.*

PROJECTS

Computer Vision **2020**
Contact Tracing AI

– Designed and implemented a COVID-19 Contact Tracing system using video object tracking and re-identification

Human Computer Interaction **2013**
TouchFree Labs

– Designed and implemented an application for manipulating 3D medical images in a surgical setting

Computer Vision, Parallel Programming **2012**
Face Detection with Improved Local Binary Patterns in CUDA

– Designed and implemented a novel parallelized face detection algorithm

Machine Learning **2011**
Comparing AdaBoost, ArcGv, ArcGvMax, & SmoothMargin Boosting with Perceptrons & Decision Stumps

– Implemented and analyzed boosting algorithms using demographic and molecular biology datasets

INTERESTS

Music Piano Performance (Royal Conservatory of Music, Grade 10, with Honours)
History and Harmony (Royal Conservatory of Music, Grade 3, First Class with Honours)
Fitness Running, weightlifting, calisthenics, yoga, cycling, swimming, canoeing, snowboarding, wilderness camping
Travel Australia, Austria, Cambodia, Canada, Colombia, Costa Rica, Czech Republic, Dominican Republic, England, France, Honduras, Hong Kong, Italy, Japan, Germany, Laos, Montenegro, The Netherlands, Poland, Portugal, Spain, Thailand, Turkey, USA, Vatican City, Vietnam