Amir H. **Karimi**

Software Engineer · Machine Learning Researcher

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"Make the change that you want to see in the world."

Education

University of Waterloo — *Waterloo, Canada*

MMath in Computer Science — *Sept. 2016 - PRESENT*

- **Academics**: 4.00 CGPA with A+ in Algorithm Design and Analysis, Convexity and Optimization, and Deep Learning
- **Thesis**: "Deep Random Projections for Learning Datasets with Few Samples"; **Supervisors**: Prof. Alexander Wong & Prof. Ali Ghodsi
- **Teaching Assistantship**:
  - CS 489/689 (Head TA): *Machine Learning*
  - CS 234: *Data Types and Structures*
  - CS 240: *Data Structures and Data Management*
  - CS 251: *Computer Organization and Design*

University of Toronto — *Toronto, Canada*

B.A.Sc. in Engineering Science – Electrical and Computer Option — *Sept. 2010 - June 2015*

- **Academics**: 3.66 CGPA with A+ in Python, Calculus I, II, and III, Electromagnetism, Structures and Materials, Inference Algorithms, Neural Bioelectricity, and Engineering Communications
- **Thesis**: "Benchmarking a Neuro-biologically Inspired Adaptive Controller"; **Supervisors**: Prof. Chris Eliasmith & Prof. Richard Zemel

Research Experiences

I have undertaken collaborative research at 3 internationally acclaimed research institutions, in addition to my collaboration with the Facebook AI Research (FAIR) lab during my full-time tenure at the company. I have had experience in leading a small team and have sought to develop and cultivate a spirit of creativity and cross-pollination of ideas. My research spans various fields of research, primarily in Deep Learning, Machine Intelligence, Representation Learning, Neural Engineering, and Computer Vision.

University of Waterloo & University of Toronto — *Waterloo, Canada*

Research Assistant - Center for Theoretical Neuroscience — *Sept. 2014 - April 2015*

- Built a neurologically plausible model of an adaptive robotic arm controller using the Neural Engineering Framework.
- Successfully benchmarked the controller on neuromorphic hardware showing that it does indeed generalize to test data in real-time.

University of Waterloo — *Waterloo, Canada*

Research Assistant - Vision and Image Processing Lab — *May. 2014 - Aug. 2014*

- Developed a novel method to compute video saliency and track moving objects based on spatio-temporal features.
- Led a team of 3 in conducting experimental analysis and setup for the project.
- Published our work in the proceedings of the International Conference for Image Processing (ICIP).

Stanford University — *Stanford, USA*

Research Assistant - High Frequency Lab — *May. 2012 - Aug. 2012*

- Developed software to remotely control, and acquire live data from an oscilloscope using GPIB and TCP/IP protocols.
- Experimented with GHz radar antennae to classify human hand-motion gestures in real-time.
- Successfully developed a directive helical antenna coupled with machine learning algorithms that measured the time-of-flight of moving objects, localizing them in 2D space with sub-millimeter precision.

University of Waterloo — *Waterloo, Canada*

Research Assistant - Vision and Image Processing Lab — *May. 2011 - Aug. 2011*

- Implemented a novel 3D denoising algorithm and successfully removed hardware noise from corneal tomography imagery.
- Utilized the MEX compiler linking Matlab and C code yielding 18x improvements in processing 3D image datasets.
- Applied the new denoising algorithm, along with image processing methods such as the Harris corner detection algorithm, directional derivatives and non-maximal suppression techniques on the corneal datasets to locate and evaluate the health of keratocyte cells.
- Successfully developed a novel system for the automatic & precise detection and counting of keratocytes in human corneal stroma.

Honors & Awards

2017	**Recipient**, Ontario Graduate Scholarship ($15,000)	*Waterloo, Canada*
2017	**Recipient**, President's Graduate Scholarship ($10,000)	*Waterloo, Canada*
2017	**Recipient**, Graduate Research Scholarship ($9,000)	*Waterloo, Canada*
2016	**Recipient**, Graduate Research Scholarship ($3,000)	*Waterloo, Canada*
2015	**Recipient**, Spirit of EngSci Award for outstanding contribution to Engineering Science community	*Toronto, Canada*
2015	**Recipient**, Dean's Honour List (7/8 semesters)	*Toronto, Canada*
2014	**Recipient**, The Next 36 Entrepreneurship Institute	*Toronto, Canada*
2013	**Recipient**, Shaw Design Scholarship ($5,000)	*Toronto, Canada*
2012	**Recipient**, Exceptional Opportunities Award in Engineering Science ($3,000)	*Stanford, USA*
2012	**Recipient**, Peter Sands Scholarship Award in Engineering Science ($2,000)	*Toronto, Canada*
2012	**Finalist**, Deloitte Consulting Competition	*Toronto, Canada*
2012	**Finalist**, National Business and Technology Conference (NBTC) Consulting Competition	*Toronto, Canada*
2010	**Top 0.1%**, Iranian National University Entrance Exam (*"Konkoor"*)	*Shiraz, Iran*
2009	**Finalist**, Iranian Mathematics Olympiad	*Shiraz, Iran*
2008	**3rd place**, Provincial Computer Skills Competition	*Shiraz, Iran*
2003	**Recipient**, Awarded 2 Gold, 8 Silver, and 8 Bronze medals from regional chess competitions	*Waterloo, Canada*

Publications & Conference Presentations

2017	Banijamali E.*, **Karimi A. H.***, Ghodsi A., Wong A., "JADE: Joint Autoencoders for Dis-Entanglement" (POSTER)	*NIPS*	W*
2017	**Karimi A. H.**, Shafiee M. J., Ghodsi A., Wong A., "Ensembles of Random Projections for Nonlinear Dimensionality Reduction" (ORAL - BEST PAPER RUNNER UP)	*CVIS*	C*
2017	**Karimi A. H.**, "A Summary of the Kernel Matrix & Learning it using Semidefinite Programming"	*arXiv*	-
2017	**Karimi A. H.**, Shafiee M. J., Ghodsi A., Wong A., "Synthesizing Deep Neural Network Architectures using Biological Synaptic Strength Distributions" (POSTER)	*CCN*	C*
2017	**Karimi A. H.**, Chung A., Shafiee M. J., Khalvati F., Haider M. A., Ghodsi A., Wong A., "Discovery Radiomics via a Mixture of Deep ConvNet Sequencers for Multi-Parametric MRI Prostate Cancer Classification" (ORAL)	*ICIAR*	C*
2017	**Karimi A. H.**, Chung A., Shafiee M. J., Khalvati F., Haider M. A., Ghodsi A., Wong A., "Discovery Radiomics via a Mixture of Expert Sequencers using Layered Random Projections (LaRP) for Prostate Cancer Classification" (ORAL)	*IMNO*	C
2016	Miller A., Fisch A., Dodge J., **Karimi A.H.**, Bordes A. and Weston J., "Key-Value Memory Networks for Directly Reading Documents" (ORAL)	*EMNLP*	C*
2016	**Karimi A.H.**, Shafiee M.J., Scharfenberger C., BenDaya I., Haider S., Talukdar N., Clausi D.A., Wong A., "Spatio-temporal saliency detection using abstracted fully-connected graphical models" (ORAL)	*ICIP*	C*
2012	**Karimi A.H.**, Wong A., and Bizheva K., "Automated detection and cell density assessment of keratocytes in the human corneal stroma from ultrahigh resolution OCT" (ORAL)	*SPIE Photonics*	C*
2011	**Karimi A.H.**, Wong A., and Bizheva K., "Automated detection and cell density assessment of keratocytes in the human corneal stroma from ultrahigh resolution OCT"	*Optics Express*	J*

(- peer-reviewed)*

Invited Talks

2017	**"Learning a Probabilistic Latent Space of Object Shapes via 3D Generative-Adversarial Modeling"**, @ Data Science Lab	*Waterloo, Canada*
2017	**"An Introduction to Random Projection Theory and Applications"**, @ Data Science Lab	*Waterloo, Canada*
2017	**"Using Low-Rank Kernel Approximation to Speed Up CNNs"**, @ Data Science Lab	*Waterloo, Canada*
2016	**"Theory and Implementation of Locality-Sensitive Hashing"**, @ Data Science Lab	*Waterloo, Canada*
2016	**"The decision to join, and the decision to leave Facebook"**, @ Vision and Image Processing Lab	*Waterloo, Canada*
2015	**"From Shahed to Broadway"**, @ alma mater highschool	*Shiraz, Iran*
2015	**"The Perfect Human" ("Al Ensan Al Kamel" - book excerpt)**, @ UofT Iranian Qur'an Group	*Toronto, Canada*
2015	**"100 percent of the shots you don't take are a miss!"**, @ Galbraith Society Summer Experience Workshop: presented my internship and startup experiences, to help first and second year students discover opportunities in industry and academia, and tips on how they may apply for similar positions.	*Toronto, Canada*

Program Committees & Volunteer Work

2017	**Director of Strategy**, First Institute of Canadian Inventors (FICI) - Waterloo Chapter; ~100 members	*Waterloo, Canada*
2017	**Volunteer**, Conference on Vision and Imaging Systems (CVIS); ~150 attendees	*Waterloo, Canada*
2016	**Volunteer**, Conference on Vision and Imaging Systems (CVIS); ~150 attendees	*Waterloo, Canada*
2015	**Organizer and Instructor**, Hosted a series of lectures for 4 students (aged 9-12) on basics of computer programming (using "Scratch"), logic and combinatorics, and how to build a computer.	*Shiraz, Iran*
2014	**Organizer**, William's GoFundMe Fundraiser; we raised $1,100 for a student photographer who had gotten his camera damaged the night of a school photo shoot; we bought him a new camera body.	*Toronto, Canada*
2013	**Director of Business Development**, University of Toronto Developers Club (UofTDev)	*Toronto, Canada*
2013	**Director of Logistics**, Engineering Science Educational Conference (ESEC); ~600 attendees	*Toronto, Canada*
2012	**Mentor & Tutor**, BrilliantBrains Tutoring; 2 students, 50+ hours of tutoring lin. alg. and calculus	*Toronto, Canada*
2012	**Chaperone & Volunteer**, Engineering Science Educational Conference (ESEC); ~600 attendees	*Toronto, Canada*
2012	**Director of Finance**, Cut for Cancer - Shave the Prof. (Students Fighting Cancer); ~350 attendees	*Toronto, Canada*

Technical Experiences

I bring 7+ years of technical experience from startups to large multi-national companies, with significant experience in large-scale software projects, product design & management, and rapid prototyping of research ideas.

Facebook Inc.
New York, USA

Software Engineer — *Aug. 2015 - Sept. 2016*

- Full-stack software engineer on the Enterprise Eng. team, responsible for front-end dev using React and hphp among others.
- Developed the automated testing and logging platform for the Org Tool.
- Designed and implemented the front-end for the landing page for the Org Tool.
- Developed a customizable notification framework with multi-recipient, multi-channel, multi-reminder settings for the Org Tool.
- Developed a light-box embedded carousel dashboard for the Performance Management Tool.
- Assisted with on-boarding and recruiting for my team.

The Next 36 Entrepreneurship Institute - Brizi
Toronto, Canada

Co-founder and Hacker — *Dec. 2013 - April 2014*

- Designed the software for Brizi, a two way media portal connected to an intelligent aerial hardware platform.
- Built Brizi's audience engagement tools, aiming to increase engagement with advertising brands @ flybrizi.com/event.
- Implemented the landing page and website for Brizi @ flybrizi.com.

Facebook Inc.
Menlo Park, USA

Software Engineer Intern — *Feb. 2014 - April 2014*

- Assisted with launch of Business Manager @ business.facebook.com.
- Designed and implemented a front-end cross ad-account reporting tool, showing ad account stats (reach, spending, …) across different currencies, timezones, and localities within a business.
- Successfully reduced TTI < 7sec for Facebook's largest ad clients (100K+ ad accounts), by optimizing front-end JavaScript rendering.
- Delivered a first-of-a-kind reporting tool for Facebook's largest ad clients.

BlackBerry Inc.
Toronto, Canada

Software Engineer Intern — *May 2013 - Dec. 2013*

- Developed a webservice to automatically generate stacktraces from application crashes.
- Enabled 6,000+ automated DRT tests from WebKit ported to BB10 OS.
- Assisting with promotion of code to release branches.
- Implemented automation framework to test ported selenium webdriver code for BB10.
- Successfully integrated browser team's test automation results with company central test database.

Startup Venture - CitoPrint
Toronto, Canada

Founder, iOS Lead — *Jan. 2013 - Sept. 2016*

- Self-taught Objective-C and iOS frameworks, and developed multiple releases of the iOS app over the years of operation.
- Brought together and led a team of 3 developers (2 Android and 1 full-stack) and 1 designer.
- Established the first ever secure and authorized sharing of data between UofT IT services and student initiatives.
- Released to 30+ testers and iterated through multiple design phases to match costumer needs.
- Successfully published CitoPrint to the Apple App Store, with 850+ downloads in the first week and reaching over 15,000 unique persons on Facebook, with average of 600 daily api hits.
- www.facebook.com/citoprint.