Mohammad Norouzi

Senior Research Scientist, Google Inc.
Mountain View, CA, USA

Email: mnorouzi@google.com
Google research profile

Employment

Senior Research Scientist, Google Inc.
Google Brain team, Mar 2017 – present.

Research Scientist, Google Inc.
Google Brain team, Jan 2016 – Mar 2017.

Education

Ph.D. in Computer Science
University of Toronto, ON Canada, Sep 2010 – Dec 2015.

Thesis: Learning Compact Discrete Representations for Scalable Similarity Search

Advisor: David Fleet

M.Sc. in Computer Science
Simon Fraser University, BC Canada, Jan 2008 – Dec 2009.

Thesis: Convolutional Restricted Boltzmann Machines for Unsupervised Feature Discovery

Advisor: Greg Mori

B.Sc. in Computer Engineering
Sharif University of Technology, Tehran, Iran, Sep 2003 – Aug 2007.

Research Interests

Machine Learning, Neural Networks, Reinforcement Learning, Computer Vision, Natural Language Processing

Publications

Sara Sabour, William Chan, Mohammad Norouzi, "Optimal Completion Distillation for Sequence Learning", *Under review* at ICLR 2019.

Jongwook Choi, Yijie Guo, Marcin Moczulski, Junhyuk Oh, Neal Wu, Mohammad Norouzi, Honglak Lee, "Contingency-Aware Exploration in Reinforcement Learning", *Under review* at ICLR 2019.

Supasorn Suwajanakorn, Noah Snavely, Jonathan Tompson, Mohammad Norouzi, "Discovery of Latent 3D Keypoints via End-to-end Geometric Reasoning", NeurIPS 2018 *(Oral)*

Chen Liang, Mohammad Norouzi, Jonathan Berant, Quoc Le, Ni Lao, "Memory Augmented Policy Optimization for Program Synthesis with Generalization", NeurIPS 2018 *(Spotlight)*.

Xuanli He, Gholamreza Haffari, Mohammad Norouzi, "Sequence to Sequence Mixture Model for Diverse Machine Translation", CoNLL 2018.

Nicolas Ford, Daniel Duckworth, Mohammad Norouzi, George E Dahl, "The Importance of Generation Order in Language Modeling", EMNLP 2018.

Bhuwan Dhingra, Christopher J Shallue, Mohammad Norouzi, Andrew M Dai, George E Dahl, "Embedding Text in Hyperbolic Spaces", TextGraphs Workshop 2018.

Ofir Nachum, Mohammad Norouzi, George Tucker, Dale Schuurmans, "Smoothed Action Value Functions for Learning Gaussian Policies", ICML 2018.

Yun Liu, Timo Kohlberger, Mohammad Norouzi, George E Dahl, Jenny L Smith, Arash Mohtashamian, Niels Olson, Lily H Peng, Jason D Hipp, Martin C Stumpe, "Artificial Intelligence-Based Breast Cancer Nodal Metastasis Detection: Insights Into the Black Box for Pathologists", Archives of Pathology & Laboratory Medicine 2018.

Adams Wei Yu, David Dohan, Minh-Thang Luong, Rui Zhao, Kai Chen, Mohammad Norouzi, Quoc V Le "QANet: Combining Local Convolution with Global Self-Attention for Reading Comprehension", ICLR 2018.

Ofir Nachum, Mohammad Norouzi, Kelvin Xu, Dale Schuurmans, "Trust-PCL: An Off-Policy Trust Region Method for Continuous Control", ICLR 2018.

Chris J Maddison, Dieterich Lawson, George Tucker, Nicolas Heess, Mohammad Norouzi, Andriy Mnih, Arnaud Doucet, Yee Whye Teh, "Filtering Variational Objectives", NIPS 2017.

Ofir Nachum, Mohammad Norouzi, Kelvin Xu, Dale Schuurmans, "Bridging the Gap Between Value and Policy Based Reinforcement Learning", NIPS 2017.

Ryan Dahl, Mohammad Norouzi, Jonathon Shlens, "Pixel Recursive Super Resolution", ICCV 2017.

Sergio Guadarrama, Ryan Dahl, David Bieber, Mohammad Norouzi, Jonathon Shlens, Kevin Murphy, "PixColor: Pixel Recursive Colorization", BMVC 2017.

Michael Gygli, Mohammad Norouzi, Anelia Angelova, "Deep Value Networks Learn to Evaluate and Iteratively Refine Structured Outputs", ICML 2017.

Azalia Mirhoseini, Hieu Pham, Quoc V Le, Benoit Steiner, Rasmus Larsen, Yuefeng Zhou, Naveen Kumar, Mohammad Norouzi, Samy Bengio, Jeff Dean, "Device Placement Optimization with Reinforcement Learning", ICML 2017.

Jesse Engel, Cinjon Resnick, Adam Roberts, Sander Dieleman, Douglas Eck, Karen Simonyan, Mohammad Norouzi, "Neural Audio Synthesis of Musical Notes with WaveNet Autoencoders", ICML 2017.

Irwan Bello, Hieu Pham, Quoc V. Le, Mohammad Norouzi, Samy Bengio, "Neural Combinatorial Optimization with Reinforcement Learning", ICLR Workshop 2017.

Ofir Nachum, Mohammad Norouzi, Dale Schuurmans, "Improving Policy Gradient by Exploring Under-appreciated Rewards", ICLR 2017.

Yonghui Wu, Mike Schuster, Zhifeng Chen, Quoc V. Le, Mohammad Norouzi, Wolfgang Macherey, Maxim Krikun, Yuan Cao, Qin Gao, Klaus Macherey, Jeff Klingner, Apurva Shah, Melvin Johnson, Xiaobing Liu, Lukasz Kaiser, Stephan Gouws, Yoshikiyo Kato, Taku Kudo, Hideto Kazawa, Keith Stevens, George Kurian, Nishant Patil, Wei Wang, Cliff Young, Jason Smith, Jason Riesa, Alex Rudnick, Oriol Vinyals, Greg Corrado, Macduff Hughes, Jeffrey Dean, "Google's neural machine translation system: Bridging the Gap between Human and Machine Translation", Technical Report 2016.

Mohammad Norouzi, Samy Bengio, Zhifeng Chen, Navdeep Jaitly, Mike Schuster, Yonghui Wu, Dale Schuurmans, "Reward Augmented Maximum Likelihood for Neural Structured Prediction", NIPS 2016.

Mohammad Norouzi, "Compact Discrete Representations for Scalable Similarity Search", PhD thesis 2016.

Mohammad Norouzi, Maxwell D. Collins, David J. Fleet, Pushmeet Kohli, "CO2 Forest: Improved Random Forest by Continuous Optimization of Oblique Splits" Technical Report 2015.

Mohammad Norouzi, Maxwell D. Collins, Matthew Johnson, David J. Fleet, Pushmeet Kohl, "Efficient Non-greedy Optimization of Decision Trees", NIPS 2015.

Mohammad Norouzi, Tomas Mikolov, Samy Bengio, Yoram Singer, Jonathon Shlens, Andrea Frome, Greg S. Corrado, Jeffrey Dean, "Zero-Shot Learning by Convex Combination of Semantic Embeddings", ICLR 2014 *(Oral)*.

Mohammad Norouzi, Ali Punjani, David J. Fleet, "Fast Exact Search in Hamming Space with Multi-Index Hashing", TPAMI 2014, vol. 36, no. 6.

Mohammad Norouzi, David J. Fleet, "Cartesian k-means", CVPR 2013 *(Oral)*.

Mohammad Norouzi, David J. Fleet, Ruslan Salakhutdinov, "Hamming Distance Metric Learning", NIPS 2012.

Mohammad Norouzi, Ali Punjani, David J. Fleet, "Fast Search in Hamming Space with Multi-index Hashing", CVPR 2012.

Mohammad Norouzi, David J. Fleet, "Minimal Loss Hashing for Learning Compact Binary Codes", ICML 2011.

Mohammad Norouzi, Mani Ranjbar, and Greg Mori, "Restricted Boltzmann Machines for Learning Shift-Invariant Features", CVPR 2009.

Academic Service

Area Chair for ICLR'18, NIPS'18, ICLR'19, ICML'19.

Reviewer for NIPS, ICML, ICLR, TPAMI, IJCV, CVPR, ICCV, ECCV, BMVC.

Awards & Honors

2014 Google US/Canada PhD Fellowship in Machine Learning.

Ontario Graduate Scholarship, 2013-14, as an international student.

Ontario Graduate Scholarship, 2012-13, as an international student.

SFU Graduate Fellowship, 2009.

2nd Team, ACM ICPC Regional Contest, Tehran, 2005. 1st and 3rd teams advanced to ACM Final.

5th place (silver medal) in Central European Olympiad in Informatics (CEOI 2003), Munster, Germany.

Team member, International Olympiad in Informatics, 2003. *Iranian team could not attend IOI'03 in US.*

Gold medal in Iranian National Olympiad in Informatics, 2003. *Exempt from the national university entrance exam.*

Silver medal in Iranian National Olympiad in Informatics, 2002.

Previous Work Experience

Research Intern, Google Inc., Mountain View, CA, USA. Mentors: Samy Bengio and Yoram Singer, June 2013 – Sep 2013.

Research Intern, Microsoft Research Ltd., Cambridge, UK. Mentor: Pushmeet Kohli,
March 2013 – May 2013.

Teaching Assistant – UofT: Machine Learning, Data Structures, Algorithms, Introduction to Theory of Computation

Teaching Assistant – SFU: Discrete Mathematics

Lead Software Developer, ACM training Web application for Sharif University, 2006.

Member of the scientific committee, ACM ICPC Regional Contest, 2006 and 2007.

Member of the scientific committee, Iranian National Olympiad in Informatics, 2003-2007
Teaching in training camps and designing problems for Iranian National Informatics Olympiad.

Teaching Assistant – Sharif University: Data Structure and Algorithms, Advanced Programming in Java, Discrete Structures.

Miscellaneous

Data Structures, Algorithms, and Graph Theory: Excellent theoretical and practical background, as demonstrated in the programming competitions such as CEOI and ACM ICPC.

Programming languages skills: Proficient in C, C++, Python, TensorFlow, Java, Matlab.

Web developement skills: Experienced in Apache Struts, Hibernate, Spring, JSF, GWT, PHP, HTML.

Sports: avid cyclist, long round-trips between: Horseshoe bay & Whistler, Vancouver & Harrison hot springs, Toronto & Waterloo, Toronto & Niagara Falls.
Member of the organizing committee for Sharif university hiking club, 2006.