Keyulu Xu

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Education

Massachusetts Institute of Technology — Cambridge, MA
Ph.D., Electrical Engineering and Computer Science — *Sep. 2016 - Present*
- Advisor: Stefanie Jegelka
- Research interest: deep learning, theory, optimization

University of British Columbia — Vancouver, BC
B.Sc., Honours Mathematics and Computer Science — *Sep. 2012 - May. 2016*
- Advisor: Nick Harvey

Experience

MIT Machine Learning Group — Cambridge, MA
Research Assistant — *Sep. 2016 - Present*
- Graph neural networks.
- Deep learning theory: neural tangent kernel, out-of-distribution generalization.
- Natural language processing, adversarial learning.

Two Sigma Investments — New York, NY
Quantitative Research Intern — *Jun. 2020 - Aug. 2020*
- Alpha research.
- Techniques (machine learning) team.

Hudson River Trading — New York, NY
Fellow — *Jun. 2019 - Aug. 2019*
- Research on high frequency trading with deep learning.
- HRT AI Labs team.

National Institute of Informatics — Tokyo, Japan
Visiting Researcher — *Feb. 2016 - Present*
- Hosted by Ken-ichi Kawarabayashi.
- Research on a better and new proof of the *Four Color Theorem* with more profound mathematical understanding and faster coloring algorithms.

Google Inc. — New York, NY
Software Engineering Intern — *May. 2015 - Aug. 2015*
- Designed a distributed and cloud data storage infrastructure.

UBC Theory Group — Vancouver, BC
Research Assistant — *May. 2014 - Aug. 2014*
- Research on spectral graph theory and randomized algorithms.

UBC Scientific Computing Lab — Vancouver, BC
Research Assistant — *May. 2013 - Aug. 2013*
- Developed a high-performance numerical computing package with iterative solvers for large-scale sparse saddle-point systems.

Publications

What Can Neural Networks Reason About?
Keyulu Xu, Jingling Li, Mozhi Zhang, Simon S. Du, Ken-ichi Kawarabayashi, Stefanie Jegelka. *In Proceedings of the 8th International Conference on Learning Representations (ICLR), 2020.* **Spotlight (4% acceptance rate).**

Graph Neural Tangent Kernel: Fusing Graph Neural Networks with Graph Kernels.
Simon S. Du, Kangcheng Hou, Barnabás Póczos, Ruslan Salakhutdinov, Ruosong Wang, and Keyulu Xu.
Advances in Neural Information Processing Systems (NeurIPS), 2019.

How Powerful are Graph Neural Networks?
Keyulu Xu, Weihua Hu, Jure Leskovec, Stefanie Jegelka.
In Proceedings of the 7th International Conference on Learning Representations (ICLR), 2019.
Oral Presentation (1.5% acceptance rate).

Are Girls Neko or Shōjo? Cross-Lingual Alignment of Non-Isomorphic Embeddings with Iterative Normalization.
Mozhi Zhang, Keyulu Xu, Ken-ichi Kawarabayashi, Stefanie Jegelka, Jordan Boyd-Graber.
In Proceedings of the 57th Association for Computational Linguistics (ACL), 2019.

Representation Learning on Graphs with Jumping Knowledge Networks.
Keyulu Xu, Chengtao Li, Yonglong Tian, Tomohiro Sonobe, Ken-ichi Kawarabayashi, Stefanie Jegelka.
In Proceedings of the 35th International Conference on Machine Learning (ICML), 2018.
Long Talk (8% acceptance rate).

Distributional Adversarial Networks.
Chengtao Li, David Alvarez-Melis, Keyulu Xu, Stefanie Jegelka, Suvrit Sra.
In the 6th International Conference on Learning Representations Workshop Track (ICLR), 2018.

Generating Random Spanning Trees via Fast Matrix Multiplication.
Nicholas J.A. Harvey and Keyulu Xu.
In Proceedings of the 12th Latin American Theoretical Informatics Symposium (LATIN), 2016.

Awards and Fellowships

Hudson River Trading AI Labs Fellowship, 2019

Chevron-MIT Energy Fellowship, 2019

David S. Y. and Harold Wong Fellowship, 2017

Andrew and Erna Viterbi Fellowship, 2016

Work Learn Undergraduate Research Award, 2014

Silver Medal, ACM-ICPC Programming Contest Pacific NW Region, 2013

Skills

Programming Languages
C++, Python (PyTorch, Tensorflow, JAX), Go, Java, Matlab, Scheme

Natural Languages
Chinese, Japanese, English

Miscellaneous
Passed CFA Level I