Lei Chen

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https://leichen2018.github.io

Research Interests

General Interests: Theories and Applications of Machine Learning

Current Domains: Optimization in Deep Learning, Science of Deep Learning, Learning on Graphs

Education

New York University
Ph.D. student in Computer Science, Courant — Sep. 2020 - May 2025 (expected)
M.S. in Computer Science (with thesis), Courant — Aug. 2018 - May 2020
Advisor: Prof. Joan Bruna

Tsinghua University
Graduate student (non-degree), Civil Engineering — Aug. 2016 - May 2018
B.Eng. in Civil Engineering — Aug. 2012 - July 2016

Publications & Manuscripts

(* indicates joint authorship)

1. Lei Chen, Joan Bruna
   Beyond the Edge of Stability via Two-step Gradient Updates [Pdf]
   *International Conference on Machine Learning (**ICML**) 2023*

2. Lei Chen*, Zhengdao Chen*, Joan Bruna
   On Graph Neural Networks versus Graph-Augmented MLPs [Pdf]
   *International Conference on Learning Representations (**ICLR**) 2021*

3. Lei Chen, Zhengdao Chen, Joan Bruna
   Learning the Relevant Substructures for Tasks on Graph Data [IEEE]
   *IEEE International Conference on Acoustics, Speech and Signal Processing (**ICASSP**) 2021*

4. Zhengdao Chen, Lei Chen, Soledad Villar, Joan Bruna
   Can Graph Neural Networks Count Substructures? [Pdf]
   *Conference on Neural Information Processing Systems (**NeurIPS**) 2020*

5. Lei Chen, Shunwang Gong, Joan Bruna, Michael Bronstein
   Attributed Random Walk as Matrix Factorization [Pdf]
   Graph Representation Learning Workshop NeurIPS 2019

6. Shunwang Gong, Lei Chen, Michael Bronstein, Stefanos Zafeiriou
   SpiralNet++: A Fast and Highly Efficient Mesh Convolution Operator [Pdf]
   Geometry Meets Deep Learning Workshop ICCV 2019

7. Zhengdao Chen, Soledad Villar, Lei Chen, Joan Bruna
   On the Equivalence between Graph Isomorphism Testing and Function Approximation with GNNs [Pdf]
   *Conference on Neural Information Processing Systems (**NeurIPS**) 2019*

Experiences

Prescient Design
- *Machine Learning Intern* (Mentor: Andreas Loukas) — May 2022 - Aug. 2022

New York University
- *Research Assistant* (Advisor: Joan Bruna) — Feb. 2019 - present
- *Section Leader*, Grad's Inference and Representation (Instructor: Joan Bruna) — Fall 2022
- *Tutor*, Grad's Fundamental Algorithms (Instructor: Alex Alekseyev) — Summer 2021
- *Grader*, Undergrad's ML course (Instructor: Benjamin Peherstorfer) — Sep. 2019 - Dec. 2019

Imperial College London
- *Visiting Research Assistant* (Advisor: Michael M. Bronstein) — June 2019 - Aug. 2019

Professional Service

Journal Reviewer: TMLR, IEEE PAMI, TNNLS, TSIPN

Conference Reviewer: NeurIPS 2021-2023, ICLR 2022-2023, ICML 2022-2023

Selected Honors/Awards

New York University MacCracken Fellowship	2020
NeurIPS 2019 Travel Award	2019
EMC Enterprise Award (3 out of 173 research projects)	2015
Third Prize (First author), 33rd Tsinghua Challenge Cup Research and Innovation Contest	2015
Third Prize (Co-first author), 33rd Tsinghua Challenge Cup Research and Innovation Contest	2015
Luojian Scholarship for Research Innovation	2015
Second Prize, Tsinghua Student Research Program (20%)	2014

Skills

Programming: C/C++, Python, Fortran, MATLAB, STATA.
Tools: PyTorch, DGL, libsvm, scikit-learn, numpy, LaTeX.
NYU Coursework: Foundations of Machine Learning, Advanced Machine Learning, Mathematics of Deep Learning, Computer Vision, Artificial Intelligence, Scientific Computing, Algebra I, Convex and Nonsmooth Optimization, Honors Analysis of Algorithms, Fundamental Algorithms, Quantum Computation, Operating Systems, Advanced Database Systems, Programming Languages.
Tsinghua Coursework: Combinatorics, Algorithms and Its Complexity Theory, Data Structures, C++ Programming.

Reference

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