Shanda Li

✉ shandal@cs.cmu.edu
lithiumda.github.io
LithiumDA

Education

Aug 2022 – present **Machine Learning Department, School of Computer Science, Carnegie Mellon University**,
Ph.D. student in Machine Learning.
Research advisor: Prof. Yiming Yang

Aug 2018 –Jul 2022 **Turing Class, School of EECS, Peking University**,
B.S. in Computer Science (Summa Cum Laude) with a minor in Mathematics.
Research advisor: Prof. Liwei Wang and Prof. Di He
Bachelor Thesis: Deep-Learning-Based Partial Differential Equation Solvers (*Top 10 Bachelor Thesis in School of EECS, Peking University, 2022*)

Research Interests

Machine Learning for Science: Machine Learning for Solving PDEs; Molecular Representation Learning.
Deep Learning Architecture Design: Transformers, Graph Neural Networks, Neural Operators, etc.

Publications

(* denotes equal contribution)

[1] **Stable, Fast and Accurate: Kernelized Attention with Relative Positional Encoding**, *NeurIPS 2021*,
Shengjie Luo*, **Shanda Li***, Tianle Cai, Di He, Dinglan Peng, Shuxin Zheng, Guolin Ke, Liwei Wang, Tie-Yan Liu

[2] **Your Transformer May Not be as Powerful as You Expect**, *NeurIPS 2022*,
Shengjie Luo*, **Shanda Li***, Shuxin Zheng, Tie-Yan Liu, Liwei Wang, Di He

[3] **Is L^2 Physics-Informed Loss Always Suitable for Training Physics-Informed Neural Network?**, *NeurIPS 2022*, Chuwei Wang*, **Shanda Li***, Di He, Liwei Wang

[4] **Learning Physics-Informed Neural Networks without Stacked Back-propagation**, *AISTATS 2023*,
Di He, **Shanda Li**, Wenlei Shi, Xiaotian Gao, Jia Zhang, Jiang Bian, Liwei Wang, Tie-Yan Liu

[5] **Can Vision Transformers Perform Convolution?**, *ArXiv Preprint*,
Shanda Li, Xiangning Chen, Di He, Cho-Jui Hsieh

[6] **Learning a Fourier Transform for Linear Relative Positional Encodings in Transformers**, *ArXiv Preprint*,
Krzysztof Choromanski*, **Shanda Li***, Valerii Likhosherstov, Kumar Avinava Dubey, Shengjie Luo, Di He, Yiming Yang, Tamas Sarlos, Thomas Weingarten, Adrian Weller

Visiting Positions

Mar 2021 – Jun 2021 **Machine Learning Group**, *Research intern*, Microsoft Research Asia (MSRA)
Mentor: Guolin Ke
Research topic: Efficient Transformers with relative positional encoding

Jun 2021 – Oct 2021 **Computational Machine Learning Lab**, *Research intern*, University of California, Los Angeles (UCLA)
Host: Cho-Jui Hsieh
Research topic: The relationship between Vision Transformers and Convolutional Neural Networks

Selected Awards and Honors

Sep 2017 **First Prize**, *32nd National Mathematical Competition for High School Students*

Sep 2017 **First Prize**, *31st Chinese Chemistry Olympiad (Preliminary)*

Nov 2020 **First Prize**, *National University Mathematical Contest*, Chinese Mathematical Society

Nov 2021 **SenseTime Scholarship**, *30 undergraduates per year in the field of AI*, SenseTime

Jun 2022 **Top 10 Bachelor Thesis**, School of EECS, Peking University

Jun 2022 **Excellent College Graduate in Beijing**, *Top 1%*, Beijing Municipal Commission of Education

Invited Talks

Stable, Fast and Accurate: Kernelized Attention with Relative Positional Encoding

- Mini Research Symposium of CFCS and Turing Class, Peking University — Dec 2021

Your Transformer May Not be as Powerful as You Expect

- International Joint Conference on Theoretical Computer Science — Aug 2022

Is L^2 Physics-Informed Loss Always Suitable for Training Physics-Informed Neural Network?

- Turing Student Research Forum, Peking University — Jun 2022
- Machine Learning+X Seminar, Brown University — Oct 2022

Professional Service

Conference Reviewer: ICML 2022, 2023; NeurIPS 2022.

Teaching Assistant: Spring 2022, Probability and Statistics (A), Peking University.

Skills

Programming: Python, C/C++, LaTeX

Languages: Chinese, native speaker; English, proficient (TOEFL 108/120, Speaking 26/30)