Linjian Ma

+1 217 979 7114 ⋄ linjian@berkeley.edu ⋄ linjianma.github.io

github/Linkedin: linjianma

RESEARCH STATEMENT

My research interests lie in the intersection of numerical algorithms, high performance computing, quantum computing and machine learning. In particular, I'm now focusing on developing efficient algorithms for tensor networks with applications in data analytics and quantum simulation. In addition, I'm also working on optimization and efficient numerical implementation of neural networks.

EDUCATION BACKGROUNDS

University of Illinois at Urbana-Champaign   August 2019 - Expected 2023
PhD, Computer Science, Advisor: *Edgar Solomonik*
Area: Scientific Computing

University of California, Berkeley   August 2018 - May 2019
MEng, Computer Science, Advisor: *Michael Mahoney*   Major GPA: 3.85/4.0
Track: Data Science & Systems

University of Illinois at Urbana-Champaign   August 2016 - May 2018
MS, Mechanical Engineering, Advisor: *N.R. Aluru*   GPA: 3.97/4.0
Concentration: Computational Science and Engineering

Zhejiang University   August 2012 - June 2016
BE, Energy Engineering, Advisor: *Tao Wang and Zhongyang Luo*   GPA: 3.95/4.0
Graduate with Honors, Chu Kochen Honors College   Ranking: 1/155 in first 2 years

EXPERIENCES

RISELab, UC Berkeley   August 2018 - May 2019
Research Assistant, Advisor: *Michael Mahoney*
Capstone project: *Second order optimization of neural network learning*

Lab for Parallel Numerical Algorithms, UIUC   May 2018 - July 2018
Research Intern, Advisor: *Edgar Solomonik*
Topic: *Pairwise perturbation and multigrid in alternating least squares for tensor decomposition*

Beckman Institute, UIUC   August 2016 - December 2017
Research Assistant, Advisor: *N.R. Aluru*
Thesis: *A multiscale model for the oxide ion conducting and proton conducting solid oxide cells*

PUBLICATIONS

[1] **Linjian Ma***, Gabe Montague*, Jiayu Ye*, Zhewei Yao, Amir Gholami, Kurt Keutzer, Michael W. Mahoney, Inefficiency of K-FAC for Large Batch Size Training, *arXiv:1903.06237 [cs.LG],* March, 2019. [link]

[2] **Linjian Ma** and Edgar Solomonik, Accelerating Alternating Least Squares for Tensor Decomposition by Pairwise Perturbation, *arXiv:1811.10573 [math.NA],* November, 2018. [link]

[3] **Linjian Ma**, Pikee Priya, and N. R. Aluru, A Multiscale Model for Electrochemical Reactions in LSCF Based Solid Oxide Cells, *Journal of the Electrochemical Society*, 2018, 165: F1232-F1241. [link]

PRESENTATIONS

[1] **Linjian Ma** and Edgar Solomonik, Accelerating Alternating Least Squares for Tensor Decomposition by Pairwise Perturbation, *Scientific Computing Seminar*, 6th March, 2019, Berkeley, CA.

[2] **Linjian Ma** and N.R. Aluru, A Multiscale Model for the Reactive Mechanisms in Proton/Oxide Ion Conducting Solid Oxide Cells, *PIRE Monthly Meething*, 31st August, 2017, Champaign, IL.

[3] **Linjian Ma** and N.R. Aluru, A Multiscale Model for the Oxygen Reduction and Oxidation Reactions in LSCF Based Solid Oxide Cells, *14th US National Congress on Computational Mechanics*, 19th July, 2017, Montreal, Canada.

HONORS AND AWARDS

Computer Science Excellence Fellowship, UIUC	2019
Graduate with Honor, ZJU	2016
Meritorious Winner, Mathematical Contest In Modeling (MCM)	2015
National Scholarship for Undergraduate, ZJU	2014
The First Class Scholarship for Outstanding Students, ZJU	2013 - 2014
The First Prize in China Undergraduates Mathematical Contest	2013

SKILLS

Programming Languages	C/C++, Python, SQL, Bash, MATLAB, CUDA
ML Frameworks	Pytorch, Tensorflow

SELECTED COURSEWORK

UC Berkeley	*ML:* Introduction to Machine Learning, Convex Optimization, Understanding Deep Neural Networks, Principles of Data Science
UIUC	*Applied Physics:* Intermediate Heat Transfer, Thermal & Statistical Physics, Molecular Electronic Structure, Mathematical Methods II *Computational Science:* Finite Element Analysis, Computational Mechanics, Numerical Fluid Dynamics, Atomic Scale Simulations, Numerical Analysis *Computer Science:* Data Structures, Applied Parallel Programming, Computer System Organization, Algorithm
Zhejiang University	*Applied Math:* Mathematical Analysis(honor), Ordinary/Partial Differential Equations, Probability and Statistics *Applied Physics:* Physics(honor), General Chemistry, Fluid Dynamics, Mechanics, Thermodynamics, Heat Transfer, Electromagnetic Fields & Waves *Computer Science:* Discrete Mathematics, C Programming Language, Computational Methods