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Jerry Liu

Stanford, CA

Education

Stanford University — Ph.D. Candidate, Computational & Mathematical Engineering **Sep 2022 — Spring 2027 (expected)**
Advisor: Chris Ré

- GPA: 4.03; DOE Computational Science Graduate Fellowship.
- Relevant coursework: PDEs, numerical linear algebra, stochastics, algorithms & optimization.

Duke University — B.S. Mathematics & Computer Science, Minor in Music **Aug 2018 — Dec 2021**

- GPA: 3.99; Summa Cum Laude; Phi Beta Kappa.

Work Experience

Lawrence Berkeley National Lab, Machine Learning & Analytics — Research Intern **Jun 2023 — Sep 2023**
Advisors: N. Benjamin Erichson, Michael W. Mahoney *Berkeley, CA*

- Investigated in-context learning for solving differential equations using long-context models
- Demonstrated connection to pseudospectral numerical solvers, towards theoretical explanation for capability of transformers to in-context identify system parameters

Duolingo, Learning AI Lab — Software Engineer **Jan 2022 — Sep 2022**
Pittsburgh, PA

- Enhanced user knowledge ML model serving 9 million DAUs with multilingual large language models
- Implemented tools for model performance visualization; productionized data cleaning and model training pipelines

Lawrence Livermore National Lab — Research Intern **Jun 2021 — Dec 2021**
Advisors: Jin Yao, Kenneth Weiss *Livermore, CA*

- Developed interface reconstruction method using geometric optimization algorithms to solve incompressible Navier-Stokes equations
- Formulated advection solver with hybrid reconstruction-tracking method for multi-material fluid flow problems

Activities

Duke Computer Science — Head Undergraduate TA **Aug 2019 — Dec 2021**
Durham, NC

- TA for *CS 230: Discrete Math* in Fall 2019 — 2020; Head TA in Fall 2021
- TA for *CS 330: Algorithms* in Spring 2020 — 2021; oversaw TA interviews for Fall 2021
- Taught recitation sections to 100+ students; hosted 80+ office hours per year; reworked weekly problem sets from scratch

Honors

- **Department of Energy — Computational Science Graduate Fellow** **2022**
- **NSF GRFP** *(declined)* **2022**
- **CRA Outstanding Undergraduate Researcher — Honorable Mention** **2022**
- **Duke — Alex Vasilos Memorial Award** *for outstanding undergraduate research* **2022**
- **William Lowell Putnam Mathematical Competition – top 250** **2018 — 2019**
- **Duke — Karl Menger Award** *for outstanding performance in mathematical competition* **2019**

Selected Publications and Conference Proceedings

- **Jerry Liu**, Yasa Baig, Denise Hui Jean Lee, Rajat Vadiraj Dwaraknath, Atri Rudra, Chris Ré. "BWLer: Barycentric Weight Layer Elucidates a Precision-Conditioning Tradeoff for PINNs." Workshop for the Theory of AI for Scientific Computing @ COLT 2025 **(Best Paper Award)**
- **Jerry Liu**, Jessica Grogan, Owen Dugan, Ashish Rao, Simran Arora, Atri Rudra, Chris Ré. "Towards Learning High-Precision Least Squares Algorithms with Sequence Models." ICLR 2025.
- Roberto Garcia, **Jerry Liu**, Daniel Sorvisto, Sabri Eyuboglu. "Adaptive Rank Allocation: Speeding Up Modern Transformers with RaNA Adapters." ICLR 2025.
- Christopher Fifty, Ronald Junkins, Dennis Duan, Aniketh Iyengar, **Jerry Liu**, Ehsan Amid, Sebastian Thrun, Chris Ré. "Restructuring Vector Quantization with the Rotation Trick." ICLR 2025 **Oral (top 1.8%)**
- **Jerry Liu**, N. Benjamin Erichson, Kush Bhatia, Michael W. Mahoney, Chris Ré. "Does In-Context Operator Learning Generalize to Domain-Shifted Settings?" The Symbiosis of Deep Learning and Differential Equations III Workshop, NeurIPS 2023.