Yang, Liu

Title: Assistant Professor (Tenure Track)
    Presidential Young Professor
    Department of Mathematics
    National University of Singapore

Email: yangliu@nus.edu.sg

Website: https://scaling-group.github.io/, Google Scholar

EDUCATION

Brown University, Providence, RI, USA
Ph.D. in Applied Mathematics, May 2021
Sc.M. in Applied Mathematics, May 2018
Advisor: George Karniadakis
Dissertation: Generative Adversarial Networks for Physics-Informed Learning

Tsinghua University, Beijing, China
B.E. in Engineering Mechanics, July 2016
Tsien Hsue-Shen Elite Class in Mechanics
Outstanding Graduate Honor (Top 10%)

WORK

National University of Singapore, Singapore
Assistant Professor, Department of Mathematics, July 2024-present
Presidential Young Professor

University of California, Los Angeles, Los Angeles, CA, USA
Assistant Adjunct Professor, Department of Mathematics, July 2022-June 2024
Working with Prof. Stanley Osher.

WeRide Corp, San Jose, CA, USA
Software Engineer, June 2021-June 2022
Working on autonomous driving systems.

AWARDS

- Presidential Young Professorship, National University of Singapore (2024)
- David Gottlieb Memorial Award, Brown University, USA (2021)
- Outstanding Graduate Honor (Top 10%), Tsinghua University, China (2016)
- Scholarship for Academic Excellence, Tsinghua University, China (2013, 2015)
- Tsien Hsue-Shen Elite Class in Mechanics, Tsinghua University, China (2012-2016)

GRANTS

- Singapore National Research Foundation Fellowship, August 2025 - August 2030

SELECTED PUBLICATIONS

* indicates equal contribution. † indicates corresponding author(s).

- Yadi Cao*, Yuxuan Liu*, Liu Yang, Rose Yu, Hayden Schaeffer, and Stanley Osher†. "VICON: Vision In-Context Operator Networks for Multi-Physics Fluid Dynamics Prediction" *Transactions on Machine Learning Research* (2026).

- Xinyu Ma, Chengxin Wang, Meng Wang, Xu Guo, Liu Yang†, and Huajian Gao†. "Gaussian Ensemble Topology (GET): A New Explicit and Inherently Smooth Framework for Manufacture-Ready Topology Optimization" *arXiv:2510.05572* (2025).

- Liu Yang, Siting Liu, and Stanley J. Osher†. "Fine-Tune Language Models as Multi-Modal Differential Equation Solvers" *Neural Networks* (2025): 107455.

- Liu Yang, and Stanley J. Osher[†]. "PDE Generalization of In-Context Operator Networks: A Study on 1D Scalar Nonlinear Conservation Laws" *Journal of Computational Physics* 519 (2024): 113379.

- Liu Yang, Siting Liu, Tingwei Meng, and Stanley J. Osher[†]. "In-Context Operator Learning With Data Prompts for Differential Equation Problems" *Proceedings of the National Academy of Sciences* 120.39 (2023): e2310142120.

- Xuhui Meng[*], Liu Yang[*], Zhiping Mao, José del Águila Ferrandis, and George Em Karniadakis[†]. "Learning Functional Priors and Posteriors from Data and Physics." *Journal of Computational Physics* 457 (2022): 111073.

- Liu Yang, Constantinos Daskalakis, and George E. Karniadakis[†]. "Generative Ensemble Regression: Learning Particle Dynamics From Observations of Ensembles with Physics-Informed Deep Generative Models" *SIAM Journal on Scientific Computing* 44.1 (2022): B80-B99.

- Liu Yang, Tingwei Meng, and George E. Karniadakis[†]. "Measure-Conditional Discriminator with Stationary Optimum for GANs and Statistical Distance Surrogates" *arXiv:2101.06802* (2021).

- George Em Karniadakis[†], Ioannis G. Kevrekidis, Lu Lu, Paris Perdikaris, Sifan Wang, and Liu Yang. "Physics-Informed Machine Learning" *Nature Reviews Physics* 3.6 (2021): 422-440. (alphabetical order)

- Liu Yang[*], Xuhui Meng[*], and George Em Karniadakis[†]. "B-PINNs: Bayesian Physics-Informed Neural Networks for Forward and Inverse PDE Problems With Noisy Data" *Journal of Computational Physics* 425 (2021): 109913.

- Xiaoli Chen, Liu Yang, Jinqiao Duan, and George Em Karniadakis[†]. "Solving Inverse Stochastic Problems From Discrete Particle Observations Using the Fokker–Planck Equation and Physics-Informed Neural Networks" *SIAM Journal on Scientific Computing* 43.3 (2021): B811-B830.

- Dixia Fan[*], Liu Yang[*], Zhicheng Wang[*], Michael S. Triantafyllou[†], and George Em Karniadakis. "Reinforcement Learning for Bluff Body Active Flow Control in Experiments and Simulations" *Proceedings of the National Academy of Sciences* 117.42 (2020): 26091-26098.

- Liu Yang, and George Em Karniadakis[†]. "Potential Flow Generator With L_2 Optimal Transport Regularity for Generative Models" *IEEE Transactions on Neural Networks and Learning Systems* 33.2 (2020): 528-538.

- Liu Yang, Dongkun Zhang, and George Em Karniadakis[†]. "Physics-Informed Generative Adversarial Networks for Stochastic Differential Equations" *SIAM Journal on Scientific Computing* 42.1 (2020): A292-A317.

- Guofei Pang, Liu Yang, and George Em Karniadakis[†]. "Neural-Net-Induced Gaussian Process Regression for Function Approximation and PDE Solution" *Journal of Computational Physics* 384 (2019): 270-288.

- Dongkun Zhang, Liu Yang, and George Em Karniadakis[†]. "Bi-Directional Coupling Between a PDE-Domain and an Adjacent Data-Domain Equipped With Multi-Fidelity Sensors" *Journal of Computational Physics* 374 (2018): 121-134.

TEACHING

- Principles of Machine Learning, National University of Singapore (Fall 2025)

- Modeling and Numerical Simulations, National University of Singapore (Co-Instructor, Spring 2025, 2026)

- Advanced Topics in Machine Learning, National University of Singapore (Spring 2025, 2026)

- Topics in Applied Mathematics (on the topic of scientific machine learning), National University of Singapore (Fall 2024)

- Instructor, Program in Computing 16A: Python with Application, UCLA (Winter 2023, Spring 2023, Fall 2023)

- Instructor, Program in Computing 10A: Introduction to Programming (C++), UCLA (Fall 2022, Spring 2024)
- Instructor, Program in Computing 10B: Intermediate Programming (C++), UCLA (Winter 2024)
- Teaching assistant, Summer@ICERM 2020 Program: Fast Learning Algorithms for Numerical Computation and Data Analysis, The Institute for Computational and Experimental Research in Mathematics (Summer 2020)
- Teaching assistant, Operations Research: Deterministic Models, Brown University (Spring 2020)
- Teaching assistant, Statistical Inference, Brown University (Fall 2019)