

Wai Tong Chung

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Education

Stanford University

Stanford, CA

Ph.D. Mechanical Engineering. Advised by Prof. Matthias Ihme.

Sept. 2018 - Exp. June 2024

Thesis (WIP): Overcoming Small Datasets in ML Studies of Computational Reacting Flows.

Research Focus: Machine Learning, AI for Science, High-Performance Computing, Energy.

Courses: Deep Learning, Computer Vision, Mining Massive Datasets, Parallel Computing, Linear Algebra, Numerical Methods, Fluid Mechanics, etc.

Imperial College London

United Kingdom

B.Eng. M.Eng. Mechanical Engineering. First Class Honours.

Sept. 2013 - Aug. 2017

Thesis: Two-dimensional Probability Density Function Model for HCCI Combustion.

Experience

Stanford University

Stanford, CA

Machine Learning Research Assistant

Sept. 2018 - Exp. June 2024

Investigating ML for multi-physics energy, propulsion, and wildfire modeling.

Wildfire Science Teaching Assistant

Mar 2023 - June 2023

Developed teaching material for empirical/computational/ML-based wildfire modeling.

Lawrence Livermore National Laboratory

Livermore, CA

Deep Learning Research Intern

June 2022 - Sept. 2022

Explored deep learning methods for climate modeling and COVID-19 drug discovery.

JPMorgan Chase & Co.

United Kingdom

Financial Messaging Software Engineer

Sept. 2017 - Aug. 2018

Developed, deployed, and tested a Java-based global financial messaging application.

Imperial College London

United Kingdom

Environmental Engineering Research Assistant

June 2017 - Aug. 2017

Prototyped light and acoustic sensor networks for flood warning systems in Nepal.

Selected Publications*

P. Sharma, **W.T. Chung**, B. Akoush, M. Ihme. A Review of Physics-informed ML in Fluid Mechanics. *Energies* 16(5):2343 (2023). [[.pdf](#)]

W.T. Chung, K.S. Jung, J. H. Chen, M. Ihme. The Bearable Lightness of Big Data: Towards Massive Public Datasets in Scientific ML. In: *ICML AI4Science W.*, 2022. [[.pdf](#)]

D.D. Wu, **W.T. Chung**, M. Ihme. ML for Safely Landing on Mars. In: *NeurIPS ML4PS W.*, 2022. [[.pdf](#)]

M. Ihme, **W.T. Chung**, A.A. Mishra. Combustion ML: Principles, Progress, and Prospects. *Prog. Energy Combust. Sci.* 91:101010, 2022. [[.pdf](#)]

W.T. Chung, A.A. Mishra, M. Ihme. Interpretable Data-driven Methods for Subgrid-scale Closure in LES for Transcritical LOX/GCH₄ Combustion. *Combust. Flame* 239:111758, 2022. [[.pdf](#)]

W.T. Chung, A.A. Mishra, N. Perakis, M. Ihme. Accelerating High-fidelity Combustion Simulations with Classification Algorithms. In: *AAAI MLPS Spring Symp.*, 2021. [[.pdf](#)]

*Refer to my [Google Scholar](#) for a complete list.

Awards

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|--|-----------|
| Stanford Climate-Centered AI Affinity Group Award | 2023 |
| Stanford Human-Centered AI Graduate Fellowship | 2022-2023 |
| Stanford School of Engineering Graduate Fellowship | 2018-2019 |
| Imperial College Mechanical Engineering Most Outstanding Thesis Prize | 2017 |
| Imperial College Mechanical Engineering Dean's List (Top 10% of Class) | 2017 |
| Imperial College Engineering Undergraduate Research Award | 2017 |

Professional Activities

Wrote Google Award for Inclusion Research Grant (Awarded \$60,000): *Forecasting wildfire pollutant transport using physics-informed ML*, PI: M. Ihme, 2022. [[info](#)]

Wrote NERSC Award Grant (Awarded 11.2M CPU hours): *High-fidelity simulations of multi-mode compression and alternative-fuel effects in rapid compression machines*, PI: M. Ihme, 2022. [[info](#)]

Wrote NASA Early Stage Innovations Grant (Awarded \$650,000): *Supersonic retropropulsion wind tunnel data analysis*, PI: M. Ihme, 2021. [[info](#)]

Invited Speaker, Towards Massive Public Datasets in Scientific ML. In: *Stanford HAI Grad. Seminar*, 2022.

Invited Speaker, Potential and Challenges of ML in Industrial and Environmental Reacting Flows. In: *K1st World Symposium*, 2022.

Reviewer for *ML Reproducibility Challenge*, 2023.

Reviewer for *International Journal of Engine Research*, 2023.

Reviewer for *ASME Turbomachinery Technical Conference & Exposition*, 2023.

Reviewer for *International Journal of Engine Research*, 2023.

Reviewer for *ML and the Physical Sciences Workshop at NeurIPS*, 2021, 2022.

Reviewer for *AI for Science: Progress and Promises Workshop at NeurIPS*, 2022.

Session Chair for *Turbulent Combustion at the U.S. Natl. Combust. Meet.*, 2022.

Session Chair for *Numerical/Computational Combustion at the Int. Symp. Combust.*, 2022.

AI/ML Technical Lead for *Stanford Fx Lab (PI: M. Ihme)*, 2022-Present.

Lead organizer for *Stanford HAI Climate-Centered AI Seminar Series*, 2023.

Co-organizer for *Stanford Mechanical Engineering Student Committee*, 2019-2022.

Co-organizer for *Imperial College London Mechanical Engineering Society*, 2016-2017.

Open-source Projects

BLASTNet simulation dataset. [blastnet.github.io]

Multi-GPU deep learning tutorials for 3D datasets. [github.com/blastnet/kaggle_tutorials]

Intro. to ML tutorials. [github.com/IhmeGroup/CombML-Tutorials]

Skills

Programming

Proficient: Python, PyTorch (Lightning), TensorFlow, MATLAB.

Familiar: C++, PyG, Gym, PySpark, MPI, FORTRAN, Java.

Languages

Proficient: English, Malay.

Familiar: Mandarin, Cantonese.