ETH Zürich

Shizheng Wen

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My research focuses on AI4physics and Physics4AI. I strive to develop new methods through the fusion of physical models, data-driven algorithms to understand nature and sovle problems in science and engineering. Specifically, my research lies in the span of the following topics:

- Graph Neural Networks for Partial Differential Equations
- Scientific Machine Learning for Physical Systems (fluid mechanics, Nanoscale Heat Transfer)
- Data-driven Discovery of Governing Laws, Physics Informed Neural Networks
- Finite Element Method, Molecular Dynamics, Density Functional Theory

Education

- **ETH Zürich** — **Zürich, Switzerland**
  M.S. Candidate — *2022 – present*
  Department of Mathematics
  M.S. Major in Computational Science and Engineering
  Advisor: undetermined

- **Nanjing University of Aeronautics and Astronautics** — **Nanjing, China**
  Undergraduate, GPA: 92/100 (Top 1% in 248 Students) — *2014 – 2020*
  Major in Aircraft Power Engineering, School of Energy and Power Engineering
  Advisor: Xianglei Liu

Visiting Position

- **Renmin University of China** — **Online**
  Gaoling school of artificial intelligence — *2022.4-present*
  Host: Hao Sun,
  Working on graph neural networks and partial differential equations.

- **Nanjing University of Aeronautics and Astronautics** — **Nanjing, China**
  Institute of Nano Science — *2020.10-2022.4*
  Host: Wanlin Guo,
  Working on the underlying mechanism of ultra-low energy loss in biomolecular motor.

- **Duke University** — **Durham, NC, U.S.**
  Aeroelasticity Group — *2019.7-2019.10*
  Host: Earl Dowell,
  Working on the fusion of machine learning and nonlinear fluid flows.

Publication

(* denotes the corresponding author)

1. **Shizheng Wen***, Michael W. Lee, Kai M. Kruger Bastos, Earl H. Dowell. **Application of Convolutional Neural Networks for Feature Identification in Complex Fluid Flows**, *Preprint* (2022), arXiv:2208.09663.
2. **Shizheng Wen**, Chunzhuo Dang, Xianglei Liu*. **A Machine Learning Strategy for Modeling and Optimal design of Near-Field Radiative Heat Transfer**, *Appl. Phys. Lett.* 121 (2022), 071101.

3. Chunzhuo Dang, Xianglei Liu*, Haifeng Xia, **Shizheng Wen**, Qiao Xu. **High-performance three-body near-field thermophotovoltaic energy conversion**, *J. Quant. Spectrosc. Radiat. Transf.* 259 (2020), 107411.
4. **Shizheng Wen**, Xianglei liu*, Sheng Cheng, Zhoubing Wang, Shenghao Zhang, Chunzhuo Dang. **Ultra-high thermal rectification based on near-field thermal radiation between dissimilar nanoparticles**, *J. Quant. Spectrosc. Radiat. Transfer* 234 (2019), pp. 1-9.

HONORS AND AWARDS

Best Undergraduate Thesis award (top 1%)	2020
University Achievements Award (nominee), NUAA (the highest honor for graduates)	2020
Chancellor's Honorary Scholarships, NUAA (the highest honor for undergraduate student)	2019
National Scholarship, Ministry of Education of P.R. China (top 1%)	2019
Boeing Scholarship, Boeing Aerospace company (16 among the whole university)	2018
Nanjing University of Aeronautics and Astronautics Scholarship - First Prize (top 3%)	2017-2019

SKILLS AND OTHERS

Programming: Expertise in Python, Matlab, C++, R language, SPSS, LINGO and various machine learning algorithms (tensorflow, Pytorch), finite element programming
Molecular Dynamics Simulations: VMD, NAMD, tcl/tk language
Modeling: ANSYS, Abaqus (finite element analysis), Multisim, ProE and AutoCAD
Hobbies: Violin, Guitar, Tennis, Soccer, Billiards, Swimming, Music, Rubik's Cube