Pi Square

Personal Information

Birth Date:	1992	Phone:	+86 15201523301
Addr:	ZJ#14, Tsinghua University	Email:	hpp1681@gmail.com

Education

2010.9-2014.7	Department of Engineering Physics, Tsinghua University, Bachelor
	Majored in Physics. Received the **first-class scholarship** for outstanding academics at Tsinghua University
2014.9-2020.7	Institute of Advanced Study, Tsinghua University, Ph.D.
	Majoring in applied mathematics

Project and research

2019.1-2019.09	Revealing unknown dynamics through machine learning	THU
	• Extracting the patterns from the complex data is a critical problem in many areas. We replace the network in the machine learning by differential equations (ODEs) with multiple coefficients and optimize the parameters using machine learning methods, in preparation.	
2017.3-2019.3	Linear and nonlinear electromagnetic waves in modulated honeycomb media	THU
	• Dynamics of nonlinear waves near the Dirac point in a two-dimensional honeycomb structure. Numerical simulations of the original equations and derived envelope equation agree perfectly. Published by Studies in Applied Mathematics (CiteScore Q1). See https://arxiv.org/abs/1909.04933 for detail.	
2018.1-2018.10	Topologically Protected Edge Mode Simulation	THU
	• Dynamic Analysis and Calculation of Topologically Protected Edge States in Two-Dimensional Honeycomb Structure, in preparation.	
2017.6-2017.9	Visiting Scholar: Evolution of Nonlinear Wave Equations with TB model	CU Boulder
	• Numerical calculation of nonlinear waves in a honeycomb structure.	
	• Analyze data structures, design numerical formats, calculate solutions for partial differential equations, and use Matlab and Python code for thousands of lines.	
2017.6-2018.10	Application of Machine Learning in the Determination of Flow Stability	THU
	• Through the method of machine learning, the phase transition point in the physical process is identified. For example, the Kelvin‑Helmholtz instability can occur when there is velocity shear in a single continuous fluid, or where there is a velocity difference across the interface.	

basic skills

English:	CET/6	Literature reading and writing, free communication with native English speakers.
computer :		Proficiency in **Python**, Matlab and etc, familiar with **Pytorch**. Familiar with **Linux**, skilled use of Vim, personal website http://www.piswebs.com.
mathematics :		Familiar with **machine learning theory**, and numerical methods for matrix. Good at modeling, analysis and numerical calculation of partial differential equations (PDEs).

Thesis

[1] Pipi Hu, Liu Hong, and Yi Zhu. "Linear and nonlinear electromagnetic waves in modulated honeycomb media." Studies in Applied Mathematics (2019).

[2] Hu P, Yang W, Zhu Y, Hong L. Revealing hidden dynamics from time-series data by ODENet. arXiv preprint arXiv:2005.04849. 2020 May 11.

[3] Pipi Hu, Peng Xie, and Yi Zhu. "Line and lump solitons in nonlinear Dirac equation." In preparation.