

Gengzhi Yang

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EDUCATION

Fudan University, China

B.S. in Mathematics and Applied Mathematics

Sep 2019 - Jun 2023(Expected)

RESEARCH EXPERIENCE

ButterflyNet2D: CNN With Fourier Transform Initialization

Sep 2021 - Present

Advisor: [Yingzhou Li](#)

- Implemented a fast Fourier transform algorithm(Butterfly Algorithm) in CNN with a specific structure.
- Tested the network's performance under deblur, inpaint, denoise, watermark removal and other tasks. Compared the result to other initializations.
- Made this initialization more general, work for other CNNs.
- Manuscript.

Finite Expression Method for PDE Solving through Spectral Method

Aug 2022 - Present

Advisor: [Haizhao Yang](#) and [Chunmei Wang](#)

- Re-implemented the original FEX in a spectral method.

Butterfly Algorithm in Discretization Invariant Learning

Apr 2022 - Aug 2022

Advisor: [Haizhao Yang](#) and [Chunmei Wang](#)

- Under the framework of IAE-Net, replace the original dense matrix into multi-sparse matrices using Butterfly algorithm.
- Achieve the goal of discretization invariant: works under any sampling of a infinite-dimensional functional space.
- Managed to solve the problems of limited memory, slow running speed and low efficiency.
- Apply this network to solve PDEs: burgers equation and etc.

Improvment to PINN

Sep 2022 - Present

Advisor: [Yingzhou Li](#)

- Ongoing.

TEACHING EXPERIENCES

Teaching Assistant

Calculus, MATH120045.07@Fudan University.

Sep 2022 - Jan 2023

AWARDS

- First prize of Fudan University Undergraduate Freshman Scholarship.
- Second Prize in 2021 Chinese College Student Mathematical Modeling Contest.
- Fudan University Undergraduate Academic Scholarship, 2019-2020, 2020-2021, 2021-2022.
- Third prize of Fudan University Undergraduate Scholarship, 2019-2020, 2020-2021, 2021-2022.
- Been elected in Buqing Su Top-notch Talent Program in Mathematics, 2019-2020, 2020-2021.

PROJECT EXPERIENCES

Simple Examples of Numerical Linear Algebra and Optimization

Sep 2021 - Jan 2022

Some classic algorithms are implemented.

Reflector Adjusting

Sep 2021

2021 Chinese College Student Mathematical Modeling Contest.

Drones' Location Adjusting

Sep 2022

2022 Chinese College Student Mathematical Modeling Contest.

Switch Adam into SGD

Feb 2022 - Jun 2022

Class Project of MATH 130165h@Fudan.

ACADEMIC EXPERIENCES

Calculus Seminar

Feb 2020 - Jan 2020

Seminar about Calculus.

Fourier Analysis Seminar

Sep 2020 - Jan 2021

Seminar about Fourier Analysis.

Complex Analysis Seminar

Feb 2021 - Jan 2021

Seminar about Complex Analysis.

SKILLS

Programming MATLAB, Python(Including PyTorch), R, L^AT_EX, C.