

# GENGZHI YANG

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## EDUCATION

Fudan University, China  
*B.S. in Mathematics*

*Sep 2019 - Jun 2023(Expected)*

## RESEARCH EXPERIENCES

Butterfly Net2D: CNN With Fourier Transform Initialization      Advisor: **Yingzhou Li**

*Sep 2021 - Present*

- 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.
- Since this algorithm requires a specific network structure, made this initialization more general, work for other CNNs.
- Manuscript.

Finite Expression Method for PDE Solving through Spectral Method      Advisor: **Haizhao Yang** and **Chunmei Wang**

*Aug 2022 - Present*

- Finite Expression Method for PDE Solving.

Butterfly Algorithm in Discretization Invariant Learning      Advisor: **Haizhao Yang** and **Chunmei Wang**

*Apr 2022 - Aug 2022*

- 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 problem of limited memory, slow running speed, low efficient problems
- Apply this network to solve PDEs: burgers equation and etc.

Improvment to PINN      Advisor: **Yingzhou Li**

*Sep 2022 - Present*

Improvment to PINN

## TEACHING EXPERIENCES

- Calculus, MATH120045.07@Fudan University, 2022-2033 Fall.

## 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 Outstanding Undergraduate Scholarship, 2019-2020, 2020-2021, 2021-2022.
- Been elected in Buqing Su Top-notch Talent Program in Mathematics, 2019-2020, 2020-2021.

## TECHNICAL SKILLS

Programming: MATLAB, Python(Including PyTorch), R,  $\text{\LaTeX}$ , C

## ACADEMIC AND LEADERSHIP EXPERIENCES

- **Mathematical Analysis Seminar, 2020.**
- **Fourier Analysis Seminar, 2021.**
- **Complex Analysis Seminar, 2022.**
- **Captain of *School of Mathematical Sciences*' basketball team.**