

YUECHEN ZHU

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Peking University, No. 5 Yiheyuan Road, Haidian District, Beijing

EDUCATION

Peking University

Sept 2020 – July 2024

Undergraduate Student in Computer Science and Technology, **Turing Class**

Minor in Physics

Member of Visual Computing and Learning Lab (VCL)

Advisor: Baoquan Chen, the School of Artificial Intelligence, PKU

Bin Wang, Beijing Institute for General Artificial Intelligence

Overall GPA: 3.473/4.00 (83.2/100)

Highlighted Courses:

- Computational Photography: Image Formation Theory and Deep Learning Practice: 100/100
- Randomized algorithms: 94/100
- Introduction to Visual Computing: 93/100
- Computer Graphics: 89/100
- Theoretical Mechanics (A): 89/100

RESEARCH INTERESTS

Physics-Based Computing, particularly of physical phenomena at human scales, such as fluid dynamics. I aim to merge computational physics with computer graphics, seeking to offer more intuitive and profound insights into our understanding of the world. Within this exploration, fields like differential geometry, differential equations, and computational mathematics harbor significant applications. They employ geometric language for physical modeling, introducing novel description to fluid dynamics and proposing discretization schemes to ensure the accuracy of inherent structures. The integration of diverse disciplines promises to endow us with a more comprehensive perspective toward the world.

RESEARCH EXPERIENCE

Visual Computing and Learning Lab

August 2022 - Present

Simulation in Phase Field

- Pursuing to address the contradictions among mass conservation, shape preservation, and the satisfaction of the constancy condition.
- Conducted an in-depth investigation based on **Curl-Flow**, with the aspiration of using base transformation to gather more higher-order information and get more efficient fluid reconstruction algorithms.
- Developed the simulation of the Volume of Fluid (VOF) method with strictly bounded volume and conservation.
- Developed the simulation of the phase field method with the introduction of surface tension.
- Explored the application of stochastic methods in fluid simulation capable of point-wise estimation of motion.
- Explored the development processes within phase field, level set, VOF, and Momentum of Fluid (MOF).

Visual Computing and Learning Lab

June 2021 - June 2022

Simulation in Magnetic Sand

- Analysed the singular patterns of the nonlinear magnetization equation that emerge with particle scale growth.
- Simulation of spiky edge patterns of linearly magnetized sand under an applied magnetic field.
- Employed the Fast Multipole Method in a particle-based manner.

PUBLICATION

Programming structural and magnetic anisotropy for tailored interaction and control of soft microrobots 2023 (Accepted)

*Yan, Y., Song, C., Shen, Z., **Zhu, Y.**, Ni, X., Wang, B., Christiansen, M. G., Stavrakis, S., Lintuvuori, J.S., Chen, B., deMello, A., & Schürle, S.*
Nature Communications Engineering

- Developed the magnetization simulation and analyzed the data.

LEADERSHIP AND EXTRACURRICULAR INVOLVEMENT

Chinese Physics Olympiad Simulation (CPHOS)

2020 - Present

Board Member

- CPHOS has experienced growth, expanding from ten members at the end of 2020, its initial establishment, to over one hundred at present.
- CPHOS has proficiently organized more than ten nonprofit physics competition simulation examinations, engaging participants from over one hundred schools. The number of participants in a single examination has presently stabilized at approximately one thousand individuals.

Turing Research Forum at Peking University

May, 2023

Co-Chair

- More than twenty Turing Class and Turing Graduate Program students presented their research results and shared the latest developments in their research fields.
- More than a hundred audience members registered for the conference.

Student Union of the school of Electronics Engineering and Computer Science

2022-2023

Vice President

- Initiated and organized a series of academic activities, such as lab visits and tea parties with senior students.
- Organized a series of life activities, such as the Freshman's Ball and HR face-to-face meetings.

52nd International Physics Olympiad (IPhO)

July, 2022

Grader

- Accurately completed the grading of thirty team members from six countries.

6th European Physics Olympiad (EuPhO)

May, 2022

Grader

- Accurately completed the grading in the experiment of eighteen members from four countries.

5th European Physics Olympiad (EuPhO)

May, 2021

Grader

- Accurately completed the grading in the third question of the theory of fifty-five members from twelve countries.

HONORS AND AWARDS

- The **John Hopcroft Scholarship**, 2023.
- Led a team of non-physics majors and achieved **7th** place out of nearly 300 teams in the **International Theoretical Physics Olympiad (ITPO)** in January 2021.
- Achieved a **Gold Medal** in the **36th Chinese Physics Olympiad (CPhO)** in October 2019.
- Achieved a **Silver Medal** in the **35th Chinese Physics Olympiad (CPhO)** in October 2018.