Zhaofeng Peng

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Education

Peking University Expected graduation date: Jul. 2025

Bachelor of Science in Theoretical and Applied Mechanics, Minor in Biomedical Engineering Beijing, China

- **GPA:** Overall - 3.753/4.0
- **Ranking:** 2/15
- **Coursework:** Ordinary Differential Equations, Theoretical Mechanics, Advanced Dynamics, Engineering Fluid Mechanics, Soft Matter Fluid Mechanics, Basic Physics Lab, Molecular Cell Biology, Physiology

Research Experience

Exploration of the Formation of *Vibrio cholerae* Biofilm Aug. 2024 - Sep. 2024

Advisors: Prof. Ying Li and Prof. Jing Yan University of Wisconsin-Madison

- Analysed some LAMMPS simulation results on the formation of *V. cholerae* extracellular matrix using Python
- Compared some distinct simulation methods on bacteria cells and biofilm

Exploration of the Swelling Mechanism for Charged Soft Matter Sep. 2023 - Present

Advisor: Prof. Guang Chen Peking University

- Probed the relationship between electrostatic free energy and osmotic pressure of polyelectrolyte solutions, and derived a new set of formulae for osmotic pressure
- Compared the theoretical results with some experimental data to explain the unsolved scaling laws
- Reconsidered the swelling mechanism of polyelectrolyte gels from the perspective of the balance between electrostatic free energy and elastic energy

Flexible Biosensor Designing Mar. 2023 - Jun. 2023

Course Project Peking University

- Investigated the clinical need for flexible biosensor to monitor the pressure change in stretch sock therapy
- Proposed the idea of utilizing soft magnets as the key parts of the sensor, and designed a way to measure the small change in magnetic field intensity
- Simulated the scenarios with COMSOL to support the idea

Technical Skills

Technologies & Tools:

Proficient in MATLAB, SolidWorks. Experienced in COMSOL, LAMMPS, Blender, Unity.

Languages:

Proficient in LaTeX. Experienced in C, Python, HTML.

Publications and Manuscripts

Swelling of spherical polyelectrolyte gels

Ming-Yu Duan, Jia-Dong Chen, Yi-Ming Liu, ***Zhao-Feng Peng***, Guang Chen

10.1007/s10118-024-3152-2

Osmotic Pressure of Polyelectrolyte Solutions: A Derivation from Electrostatic Free Energy (Manuscript)

Zhao-Feng Peng, Guang Chen

Erythrocyte: Relationship between Equilibrium Shape and External Salt Concentration (Manuscript)

Zhao-Feng Peng, Guang Chen

Awards and Honors

Award for Academic Excellence Dec. 2023

Peking University Scholarship, Third Prize Dec. 2023

China Mechanics Competition in Honor of Zhou Peiyuan, Honorable Mention Aug. 2023

Chinese Chemistry Olympiad in Provinces, First Prize Oct. 2020