

Sijie Li

Chinese Citizen

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Objective

I aim to develop first-principles-based mathematical models to quantitatively describe emergent properties in complex cellular systems. By integrating synthetic biology, sequencing data, and high-resolution bioimaging, I seek to extract fundamental regulatory principles and construct predictive models that bridge molecular interactions to system-level behaviors. My long-term goal is to scale these models to simulate human biological systems, accelerating experimental research and providing new insights into aging and disease mechanisms.

Education

- School Name: Southern University of Science and Technology (SUSTech)
- Major: Biomedical Engineering
- Degree: Junior B.Sc.;
- Expected Graduation Date: July 1st, 2026;
- Grate Point Average: 3.94/4.00
- Ranking: 1/70

Relevant Coursework and Specialized Knowledge

- Systems Biology, Bioinformatics, Basic Synthetic Biology, Programmable Biomolecular Design (In Progress)
- Thermodynamics and Statistical Mechanics (A+, 97/100)
- Computational Biology (A, 96/100)
- Molecular Cell Biology (A+, 97/100)
- Machine Learning and Its Medical Engineering Applications (A, 95/100)
- Signals and Systems (A, 95/100)
- Intelligent Sensing Technology (A+, 97)
- Biomedical Optics Laboratory (A, 94); Biomedical Optics (A, 95)
- Principles of Electric Circuits (A+, 99/100)

Projects and Researches Experience

- **(In class) Segment Brain Regions with fMRI Data**
 - Proposed the idea of extracting complexity features from fMRI data provided by the instructor and applying clustering to distinguish brain regions with different functions.
 - Designed and implemented a neural network for validation, achieving higher accuracy than other team members, which was highly praised by the instructor for its innovation.
 - This project enhanced my understanding of machine learning concepts and skills in coding.
- **(In class) Motion Detection via Communication Signals**
 - Analyzed radar signals to extract position and velocity of a moving subject and identified overlooked details in the professor's method.
 - Results closely matched the provided reference, with my work highly praised for its precise presentation, deep understanding of analysis techniques, and attention to technical details.
 - Enhanced my understanding of frequency-based real signal analysis and strengthened my skills in implementing signal processing methods.
- **(In Professor Zhi Luo's Lab) Cell Culture and Polymer Synthesis**
 - Cultured RAW264.7 cells and stimulated them with LPS to investigate conditions for cell polarization.
 - Learned the RAFT polymerization process and related biochemical techniques.
 - Gained specific laboratory skills and foundational principles for conducting experiments and research.
- **(In Professor Chris Soon Heng Tan's Lab) Proteomics**
 - Familiarized with the workflow for thermal proximity coaggregation (TPCA)-based proteomics analysis.
 - Acquired advanced biochemical techniques, including SILAC cell culture and Western blotting.
 - Developed a repertoire of proteomics methods, further enhancing experimental and laboratory skills.
- **(In Professor Ju Liu's Lab) Modeling for Aortic Dissection**
 - Developed a multilayered fiber wall model of the aorta using fluid-structure interaction (FSI) techniques to simulate hemodynamics in aortic dissection, leveraging high-performance computational resources and the finite element method.
 - Established the FSI mesh and carried out the computational fluid dynamics (CFD) process.
 - Acquired skills for quantitative simulation of mesoscale biological systems.

Academic Activities

- **Chemical Biology Summer Training Course**, Center of Life Science, Peking University: Advanced knowledge in chemical tools and techniques for biological research.
- **PEBBLE BioFusion Camp**, Westlake University: Exposed to complex systems and statistical physics to understand biological processes and learned advanced simulation methods.

Skills, Activities, and Awards

- **Computational and Modeling Skills:** High-performance computing (HPC), finite element modeling (FEM), fluid-structure interaction (FSI) simulations, computational fluid dynamics (CFD) analysis, and mesh generation.
- **Laboratory Skills:** Cell culture, polymer synthesis, proteomics workflows
- **Programming Languages:** Python, MATLAB, Linux, AWK, R
- **Leadership:** Publicity Minister, SUSTech Red Cross; conducted multiple first-aid lectures and participated in various community service activities.
- **Awards:** First-rank college scholarships; Outstanding Student Leader Award
- **Hobbies:** Drawing, calligraphy, running
- **Personal Traits:** Proactive, creative, goal-oriented, optimistic