ZHENYU WEI

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EDUCATION

Southeast Univeristy *June 2021*

B.S. candidate in School of Mechanical Engineering (GPA: 3.62 / 4.00, Ranking: 18 / 196)

Relevant Courses:

- Theoretical Mechanics (A^+)
- Materials Mechanics (A^+)
- Heat Transfer Theory (A)
- Thermal Dynamics (A^+)
- Electronic Technique (A^+)
- Programming and Algorithm Language (A^+)

Stanford Univeristy, Summer session *June 2019 - September 2019*

- ME346C, Advanced technology for MD simulation by Prof. Wei Cai. (A^+)
- ME414, Introduction to Solid State Physics by Prof. Thomas W. Kenny (A^+)

ACADEMIC AND RESEARCH EXPERIENCE

Independent research of ion hydration and friction in aqueous solution

Directed by Prof. Yunfei Chen, Southeast University *April 2020 - Present*

· Obtained deeper understanding of research of aqueous solution, a review under progress.

· Conducted Molecular Dynamic (MD) simulation with LAMMPS.

· Analyzed structure change of ions' hydration shell.

· Analyzed the friction of ions that results from hydrodynamic and dielectirc effects.

· Finding the reason of the abnomral increasing of ion mobility under high external electic fields (0.1V/nm - 3V/nm).

Development of toolboxes for MD simulation

Self-developed and open-sourced *October 2019 - Present*

· *Lammps_Toolbox* : A comprehensive toolbox for MD simulation, based on Matlab. Utilized by graduate students of Tsinghua Univeristy, Peking Univeristy and Centralsouth Univeristy.

· *lmp_str* : Structure maker for MD simulation, based on Julia. Utilized by a graduate student in the Baylor University.

· *lmp_data* : Data analyzer for results from MD simulation, based on Julia.

Research of abnormal ions' transportation in nanopore of Si3N4 under external electic field

Directed by Prof. Yunfei Chen, Southeast University *September 2019 - April 2020*

· Constructed model of nanopore and aqueous solution with *lmp_str*.

· Conducted MD simulations with LAMMPS.

· Analyzed the data of MD simulation with *Lammps_Toolbox*.

Implementation of Artificial Neural Network (ANN) for hydrogen bonding detecting
Self-developed *January 2020 - February 2020*

· Acquired the basic knowledge and techniques for Machine Learning.
· Implemented the Backpropagation (BP) algorithm based on Julia.
· Tested the stability of my neural network package through a familiar topic.
· Thought about the intersection research between MD and ML.

Lecture of Quantum Computation and Communication
Produced by Prof. Jianwei Pan, University of Science and Technology of China *January 2020*

· Obtained an overview of the current research of quantum computation.
· Thought about the research of many-body questions (MD, and ab init) with the assistance of a quantum computer.
· Thought about the possible revolution of simulation after the development of a robust quantum computer.

Independent development of MD Programming (basic) based on C^{++}
Research of the melting points of copper *July 2018 - September 2018*

· Obtained a basic understanding about MD simulation
· Implemented Embedded-Atom-Method (EAM) potential.

Participating Sakura Exchange Program by MSTC and JST
Start point of my research travel *June 2016 - July 2016*

· Conducted experiment with Hideki Shirakawa, co-recipient of the 2000 Nobel Prize in Chemistry.
· Took lecture by Toshihide Maskawa, co-recipient of the 2008 Nobel Prize in Physics.
· Took lecture by Mamoru Mohri, the first astronmer in Japan.

TECHNICAL STRENGTHS

Computer Languages	Julia, C^{++}, Matlab, Python
MD simulation package	LAMMPS, Hoomd-Blue
Visualizing Software	OVITO

PATENT

An energy resolver for passengers' protection *June 2018*
Patent ID: ZL201610068802.5