SONGCHEN TAN

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5 Yiheyuan Road, Peking University, Beijing, China

EDUCATION

Undergraduate Student
Chemistry Major & Physics Double Major

Peking University

Sep 2017 – Jul 2021 Beijing

First Year GPA 3.87 / 4.00 (Rank: 1/139)
Second Year GPA 3.88 / 4.00 (Rank: 3/139)
Third Year GPA 3.93 / 4.00 (Rank: 1/139)

Exchange Student

University of California, Los Angeles

Sep 2019 – Dec 2019 Los Angeles

Quarter GPA 4.00 / 4.00

AWARDS

2020 University Scholarship & Merit Student
Peking University, Top 1%

National 2nd Prize
Mathematical Contest in Modeling

2019 National Scholarship & Merit Student
Peking University, Top 1%

Exchange Student Scholarship
Peking University Education Aboard Program

2018 National Scholarship & Merit Student
Peking University, Top 1%

SKILLS

Scientific Computing

Example Projects:

- C++ `ExtendedLagrangian` (Contributing to the molecular simulation library `LAMMPS`)
- Python `FlowMM`
- Fortran `HubbardModel`
- Julia `PIMD.jl`

English Proficiency

- GRE Verbal 159 Quantitative 170 Analytical Writing 4.0
- TOEFL 112 (Reading 30, Listening 28, Speaking 26, Writing 28)

RESEARCH

Deep Generative Modeling for CG Force Fields

Supervisor: Bin Zhang
Massachusetts Institute of Technology

Jun 2020 – Oct 2020 Working Remotely

Method Combined normalizing flows and contrastive learning for constructing coarse-grained force fields from atomistic data
Result Obtained an efficient and systematic machine learning scheme, outperforming force-mapping schemes

Extended Lagrangian for Charge Equilibration

Supervisor: Teresa Head-Gordon
University of California, Berkeley

Dec 2019 – Mar 2020 Berkeley

Method Developed an extended Lagrangian scheme together with Langevin thermostat for fluctuating charges
Result Eliminated the iterative charge determination, the main bottleneck in reactive force fields like ReaxFF, and accurately reproduced statistic and dynamic properties

Dynamic Effect in Bethe-Salpeter Equation

Supervisor: Daniel Neuhauser
University of California, Los Angeles

Sep 2019 – Dec 2019 Los Angeles

Method Introduced a screened potential correction within the framework of time-dependent Bethe-Salpeter equation
Result Improved the accuracy of optical properties

Efficient Integrators for Path Integral MD

Supervisor: Jian Liu
Peking University

Jul 2019 – Current Beijing

Method Analyzed integrators in path-integral molecular dynamics with symplectic geometry and discrete-time Lyapunov equations
Result Designed a novel sampling scheme that can obtain more accurate statistics

PUBLICATIONS

(1) Tan, S.; Leven, I.; An, D.; Lin, L.; Head-Gordon, T. *Journal of Chemical Theory and Computation* **2020**, DOI: 10.1021/acs.jctc.0c00514.