SPENCER GUO

Gordon Center for Integrative Sciences
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Education

PH.D. CHEMISTRY, **The University of Chicago** 9/2020 – present
Supervisors: Profs. Aaron DINNER and Benoît ROUX
Research interests: Theoretical and computational analysis of protein mechanisms, dynamics of voltage-gating and protein dissociation, machine-learning methods for protein kinetics

M.S. CHEMISTRY, **The University of Chicago** 9/2020 – 9/2021

B.S. BIOLOGICAL CHEMISTRY, **Stanford University** 9/2016 – 6/2020
Minor in Computer Science GPA: 3.949

PUBLICATIONS AND PREPRINTS

1. Lorpaiboon, C., GUO, S. C., Strahan, J., Weare, J., & Dinner, A. R. Accurate Estimates of Dynamical Statistics Using Memory. *In preparation.*
2. GUO, S. C., Shen, R., Roux, B. & Dinner, A. R. Dynamics of activation in the voltage-sensing domain of Ci-VSP. bioRxiv:10.1101/2022.12.19.521128v2 (2023).
3. Strahan, J., GUO, S. C., Dinner, A. R., & Weare, J. Inexact iterative numerical linear algebra for neural network-based spectral estimation and rare-event prediction. *J. Chem. Phys.* **159**, 014110 (2023).

EXPERIENCE

Markland Lab Undergraduate Research Assistant
Stanford University 9/2018 – 6/2020
Simulated IR spectra of liquid water using semi-empirical methods
Benchmarked semi-empirical calculations against results from DFT
Adapted a neural network method to calculate molecular dipoles

Schrödinger Python Development Intern
New York, NY 6/2019 – 9/2019
Developed tool to identify critical residue/ligand interactions for drug development
Extended multiple sequence viewer (MSV) to analyze similarity at binding sites
Added ability to quickly visualize protein domains in MSV

Genentech Protein Engineering Intern
South San Francisco, CA 6/2018 – 9/2018
Synthesized novel peptide library for cellular assays
Analyzed protein crystal structures to direct rational macrocycle design
Analyzed instrumental purity and spectral data (LC-MS, HPLC, NMR)

Chen Lab Undergraduate Research Assistant
Stanford University 2/2017 – 6/2018
Developed novel near-IR activated caged morpholinos (cMOs)
Designed and executed synthesis of cyanine dye-based probe
Presented work at Developmental Biology seminar

OTHER ACTIVITIES

The University of Chicago Social Committee President
Physical Sciences Division 2/2023 – present
Facilitate and stimulate social event planning for graduate students in physical sciences
Manage a >$100,000 budget and allocate for events

The University of Chicago Director of Graduate Student Initiatives
Department of Chemistry 7/2022 – 6/2023
Serve as liaison between graduate students and faculty to increase open communication
Manage a $15,000 budget and organize quarterly events

The University of Chicago Teaching Assistant
Department of Chemistry 9/2020 – 6/2021
Led weekly recitation sections, held office hours, and graded assignments for 3-quarter general chemistry sequence

POSTERS

Inexact iterative numerical linear algebra for neural network-based spectral estimation and rare-event prediction. 7/2023
AI & Science Summer School 2023 Chicago, IL
Spencer Guo, John Strahan, Chatipat Lorpaiboon, Aaron R. Dinner, Jonathan Weare.

Accurate Estimates of Dynamical Statistics Using Memory 7/2022
Gordon Research Conference Computational Chemistry
Chatipat Lorpaiboon, Spencer Guo, John Strahan, Jonathan Weare, Aaron R. Dinner.

Dynamical analysis of voltage-dependent activation in Ci-VSP 2/2022
Biophysical Society Annual Meeting San Francisco, CA
Spencer Guo, Rong Shen, Eduardo Perozo, Benoît Roux, Aaron R. Dinner.

Pathways for fold switching of the circadian clock protein KaiB 2/2022
Biophysical Society Annual Meeting San Francisco, CA
Adam Antoszewski, Xiangda Peng, Nanhao Chen, Ning Zhang, Supratim Dey, Spencer Guo, Lee-Ping Wang, Andy LiWang, Tobin R. Sosnick, Aaron R. Dinner.

Unsupervised Learning on scRNA-seq Data 12/2019
Final project for CS221 (Artificial Intelligence) course Stanford, CA
Anthony Degleris, Spencer Guo, Clara Kelley. Report available here.

AWARDS

Dynamical analysis of the voltage-sensing domain in Ci-VSP 2021 – 2022
Anton 2, Pittsburgh Supercomputing Center
NSF Graduate Research Fellowship 2020 – 2024
National Science Foundation
Eckhardt Fellowship 2020 – 2025
Physical Sciences Division, The University of Chicago
Stanford Department of Developmental Biology Grant 2017
Vice Provost of Undergraduate Education, Stanford University

TECHNICAL SKILLS

Programming	(*experienced*) Python (NumPy/SciPy), Jax, bash, LaTeX
	(*familiar*) PyTorch, C/C++, Matlab, git
Software	(*experienced*) GROMACS, Amber, OpenMM, VMD
	(*familiar*) PyMOL, CP2K, DFTB+

INTERESTS

Cooking, classical music, piano, violin

Last updated July 26, 2023.