Cong Wang

845 W Taylor, Chicago IL, 60612 · (312)-340-1355 · <u>wangimagine@gmail.com</u>

my site

EDUCATION

University of Illinois   Chicago, IL
Ph.D., *Biochemical Sciences*, GPA:3.14/4.0   2015 - present

Zhejiang Normal University   Zhejiang, China
M.S., *Condensed Matter Physics*, GPA:3.5/4.0   2012 - 2015

Zhejiang Normal University   Zhejiang, China
B.S., *Physics*, GPA:3.2/4.0   2008 - 2012

RESEARCH EXPERIENCE

Development of X-ray crystallography platform (Phase II)   2020 - present
- Engineering a sample loading robot for a well-controlled crystallization process.
- Improved microscopic imaging system with multi-depth sensing.

Quantum chemistry calculation to unveil electrostatic spectral tuning of bilin molecules   2020 - present
- Built the theoretical system consisting of bilin covered by point charges.
- Simulated point charge induced absorption spectra using *orca*.
- Constructed spectral tuning map of bilin that reveals the region susceptible to point charge.
- Data processing was performed by *Python*; Visualization was accomplished by *Gnuplot*.

Molecular dynamic simulation of lyase isomerase MpeQ and its variant   2020 - present
- Built the MD system for apo-protein MpeQ/MpeA using *Charmm-GUI*.
- Carried out MD simulation using *NAMD* at high performance computing (HPC) facility.
- Data processing was done by *Tcl* and *Python*; Visualization was made by *PyMol* and *Gnuplot*.

Development of X-ray crystallography platform (Phase I)   2017 - 2019
- Developed an *in-situ* high-throughput room temperature X-ray diffraction method.
- Accelerated the development by researching effective computer vision algorithms, such as enhanced correlation coefficient (ECC) transformation and novel fast line detector.
- Applied *Python* packages like *opencv*, *RPI.GPIO*, *picamera*, *ftplib*, etc to build the software.
- Achieved fast microscopic image stitching and swift protein crystal detection.
- Streamlined data collection by creating and deploying control software on Raspberry Pi.
- Various small things: wrote a xml wrapper to control Thorlabs, Inc hardware; modeled X-ray beam profile to obtain its location; made parameter parsing protocol for seamless software integration.

Serial Laue (Polychromatic) data collection and processing of bilin-based photoreceptors   2018 - 2020
- Installed data collection platform at 14IDB of Advanced Photon Source in Argonne National Lab.
- Collected diffraction data of bilin-based photoreceptors like G3 and Pa497.
- Processed Laue diffraction data using software *Precognition* and *Epinorm*.
- Obtained structural difference (before and after light illumination) using *phenix*.

Monte-Carlo simulation of magnetic nanoparticles self-assembly   2016-2017

- Researched the sampling method for Monte-Carlo simulation.
- Integrated OpenMP protocol to parallelize the simulation implemented in *Fortran90*.
- Applied the simulation to study the magnetic nanoparticles self-assembly.

TEACHING EXPERIENCE

Chem 455 Biochemistry Lab Course Builder   2020 - present
- Filmed and edited video footage (about 4 videos every week) of lab introduction and demonstration.
- Technical support for online course building.

Chem 124/125 General Chemistry II (Physical Chemistry)   2015-2020
- Lead the discussion course over 40 students each semester.
- Advised nearly 40 students to conduct lab experiments each semester.
- Offered counsel to Teaching Assistants on how to teach particular subjects.

Unix/Linux user workshop
- Provided a text editor (Vim) training to my fellow graduate students.   Apr 2020
- Presented *Writing Your Own Vim Plugin* in the meetup group -- Vim Chicago   June 2017

SKILLS & INTERESTS

- Programming: *Python* *Gnuplot* *Mathematica* *Matlab* *Bash* *Perl*.
- Structural biology: *Phenix* *Coot* *Precognition & Epinorm* (Laue data processing) *PyMol* *VMD* *RELION* *HKL2000*.
- Computational chemistry: *ORCA* *NAMD*
- Domain specific: *OpenCV* *TensorFlow* (CNN, YOLO)
- Publishing: *Inkscape, Zotero, LaTeX, pandoc + markdown + HTML + CSS, Microsoft Word*.
- Interests: Comedy, Photography, make educational videos on YouTube.

SELECTED PUBLICATIONS

1. Z. Ren, <u>C. Wang</u>, H. Shin, S. Bandara, I. Kumarapperuma, M. Y. Ren, W. Kang, X. Yang, An automated platform for *in situ* serial crystallography at room temperature. *IUCrJ*. **7** (2020), doi:<u>10.1107/S2052252520011288</u>.
2. <u>C. Wang</u>, A. Ralko, Z. Ren, A. Rosenhouse-Dantsker, X. Yang, Modes of Cholesterol Binding in Membrane Proteins: A Joint Analysis of 73 Crystal Structures. *Direct Mechanisms in Cholesterol Modulation of Protein Function*. (Springer International Publishing, Cham, 2019; http://link.springer.com/10.1007/978-3-030-14265-0_4), vol. 1135, pp. 67–86.
3. <u>C. Wang</u>, D.-Y. Jiang, R.-A. Chen, S. Li, T. F. George, Deep localized distortion of alternating bonds and reduced transport of charged carriers in conjugated polymers under photoexcitation. *Nanoscale*. 7, 479–486 (2015).
4. <u>C. Wang</u>, L.-Q. Zhuang, R.-A. Chen, S. Li, T. F. George, Localization and Relaxation of Singlet Exciton Formation in Conjugated Polymers under Photoexcitation. *The Journal of Physical Chemistry B*. 117, 3258–3263 (2013).