Po-Nan Li

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EDUCATION

Ph.D. - Electrical Engineering, Stanford University, California, USA (2020)
Dissertation: Computational approaches for biological imaging and modeling
M.S. - Photonics Technologies, National Tsing Hua University, Hsinchu, Taiwan (2012)
Thesis: Selective excitations of localized surface plasmons in designed nanostructures
B.S. - Electrical Engineering, National Tsing Hua University, Hsinchu, Taiwan (2010)

EXPERIENCE

2019 summer **Hardware Engineering Intern**
Daydream, Google
- Applied computational imaging techniques to visual display systems for VR/AR/MR.

2015 — Present **Graduate Research Assistant**
Stanford University and SLAC National Accelerator Laboratory
Advisors: Profs. Soichi Wakatsuki and Piero Pianetta
- Develop computational imaging/microscopy techniques.
- Develop machine learning model for protein structure recognition.
- Study ion transport in biological cells with numerical models.

2012—2015 **Research Assistant**
Institute of Physics, Academia Sinica, Taiwan
Advisor: Prof. Ting-Kuo Lee
- Developed image enhancement algorithms for coherent diffraction imaging (CDI) and cryogenic electron microscopy (cryo-EM).
- Provided numerical and computational solutions for collaborators from both theoretic and experimental physics realms.

2010—2012 **Graduate Research Assistant**
Ultrafast Photonics Laboratory, National Tsing Hua University, Taiwan
Advisor: Prof. Chen-Bin Huang
- Used finite-difference time-domain (FDTD) and near-field microscopy to design and study nanoplasmonics and near-field optics.
- Performed nano-device fabrication.
- Served as a computing cluster manager.

2009—2010 **Undergraduate Research Assistant**
Ultrafast Photonics Laboratory, National Tsing Hua University, Taiwan
Advisor: Prof. Chen-Bin Huang
- Implemented a phase-modulated continuous-wave (PMCW) optical frequency comb.

SKILLS

- Python, Matlab, C/C++, SQL, HTML
- Git, PyTorch, TensorFlow, Pandas
- Arduino, AutoCAD

SELECTED COURSE PROJECTS

- CS231n: Peak finding for crystallography
- CS230: Recognition of East Asian language characters
- CS279: 3-D diffusion-reaction model for hexagonal surface layers
- CS221: Rapid peak detection for diffraction images
- EE267: PhD Archer: The VR game and UX Analysis
- CS229: Data classification for diffraction images
- EE368: Incorporating low-resolution image into phase retrieval process
- EE367: Mountable Dynamic Range Enhancer for Digital Cameras

PUBLICATIONS

Referred Journal articles

- Jonathan Herrmann, Po-Nan Li, Fatemeh Jabbarpour, Anson C. K. Chan, Ivan Rajkovic, Tsutomu Matsui, Lucy Shapiro, John Smit, Thomas M. Weiss, Michael E. P. Murphy, and Soichi Wakatsuki, "A bacterial surface layer protein exploits multi-step crystallization for rapid self-assembly," Proc. Natl. Acad. Sci. U.S.A (accepted).
- P.-N. Li, J. Herrmann, S. Wakatsuki, and H. van den Bedem, "Transport Properties of Nanoporous, Chemically Forced Biological Lattices," J. Phys. Chem. B (accepted).
- J. Hermann, P.-N. Li *et al*., "A Bacterial Surface Layer Protein Exploits Multi-step Crystallization for Rapid Self-assembly," (under review).
- P.-N. Li, J. Herrmann, B. B. Tolar, F. Poitevin, R. Ramdasi, J. R. Bargar, D. A. Stahl, G. J. Jensen, C. A. Francis, S. Wakatsuki, and H. van den Bedem, "Nutrient transport suggests an evolutionary basis for charged archaeal surface layer proteins," ISME J. **12**, 2389 (2018).
- J. Herrmann, F. Jabbarpour, P. G. Bargar, J. F. Nomellini, P.-N. Li, T. J. Lane, T. M. Weiss, J. Smit, L. Shapiro, and S. Wakatsuki, "Environmental Calcium Controls Alternate Physical States of the Caulobacter Surface Layer," Biophys. J. **112**, 1 (2017).
- P.-N. Li, Z.-H. Wu, C.-N. Hsiao, T.-K. Lee, and C.-C. Chen, "Determination of three-dimensional atomic positions from tomographic reconstruction using ensemble empirical mode decomposition," New J. Phys. **18**, 083025 (2016).
- T.-Y Lan, P.-N.Li, and T.K. Lee, "Method to enhance resolution of x-ray coherent diffraction imaging for non-crystlline bio-samples," New J. Phys. **16**, 033016 (2014).
- P.-N. Li, H.-H. Tsao, J.-S. Huang, and C-.B. Huang, "Subwavelength localization of near fields in coupled metallic spheres for single-emitter polarization analysis," Opt. Lett. **36**, 2339 (2011).

Selected conference contributions (presenter *italicized*)

- *D.A. Barmherzig*, J. Sun, T.J. Lane and P.-N. Li, "On Block-Reference Coherent Diffraction Imaging", CTH1B , OSA Computational Optical Sensing and Imaging, Orlando, FL, USA, 2018.
- *P.-N. Li*, P. Pianetta, S. Wakatsuki, and Y. Liu, "Resolution enhancement of transmission x-ray microscopy using coherent diffraction," 12th International Conference on Biology and Synchrotron Radiation, W07, Menlo Park, CA, USA, 2016.
- *P.-N. Li*, and T.-K. Lee, "Effects of missing diffraction intensities in CDI image reconstruction with template method," 12th International Conference on Biology and Synchrotron Radiation, W06, Menlo Park, CA, USA, 2016.
- *P.-N. Li*, T.-Y. Lan, and T.-K. Lee, "Method to enhance resolution of x-ray coherent diffraction imaging for non-crystalline bio-samples", International Workshop on Phase Retrieval and Coherent Scattering, Evanston, IL, USA, 2014.
- *P.-N. Li*, C.-F. Huang, S.-J. Tseng, C. Kim, Y. Kim, C.-H. Lin, T.-Y. Lan, D. Y. Noh, Y. Hwu, K. S. Liang, and T.-K. Lee, "Coherent diffraction imaging with assistance of the metallic template", The 6th International Workshop on FEL Science, Tainan, Taiwan, 2013. **[Best Poster Award winner]**
- *P.-N. Li*, H.-H. Tsao, and C.-B. Huang, "A plasmonic nanocluster designed for near-field polarization analysis," IEEE Photonics Conference, MX 4, Arlington, VA, USA, 2011.
- *P.-N. Li*, H.-H. Tsao, and C.-B. Huang, "Multiple selective excitations of localized surface plasmons in coupled gold nano-spheres," Conference on Lasers and Electro-Optics, JTuI57, Baltimore, MD, USA, 2011.