Jung Pyo (JP) Hong

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OBJECTIVE: A career-changing theoretical physicist seeking data scientist/research position in the tech industry

EDUCATION

Princeton University   Princeton, NJ
Ph.D. in Theoretical and Computational Condensed Matter Physics   *Sep. 2015 - Sep. 2022 (Expected)*
- Dissertation: *"Aspects of Symmetry and Topology in Local Density Spectroscopy"*
- Joseph Henry Merit Prize, Bershadsky Family Fellowship Fund in Physics (both awarded for academic excellence)

University of Illinois at Urbana-Champaign   Urbana, IL
B.Sc. in Engineering Physics, minor in Mathematics   *Aug. 2012 - May. 2015*
- Graduated with high honors, Bronze Tablet (awarded to top 3% of the graduating class), Dean's List (2012-2014)

COMPUTER LANGUAGES / FRAMEWORKS

Proficient: Python (numpy, pandas, matplotlib, scipy, h5py), version-control system (git), Jupyter
Working knowledge: Python (TensorFlow, scikit-learn, PySpark, Cython), SQL, MATLAB, Mathematica, Linux

RESEARCH EXPERIENCE

Visiting Graduate Student Researcher   2018 – 2021
Condensed Matter Theory Center, University of California at Berkeley   *Berkeley, CA*
- Predicted spectroscopic properties of 2D quantum materials by using Kernel-Polynomial method and group theory
- Performed multi-threaded simulation of $\sim$ 2TB spectroscopic data in high-performance computing clusters
- Proposed atomic-scale scanning tunneling microscopy (STM) as an ideal experimental tool to detect novel symmetry-breaking patterns in strongly-correlated electronic systems simulated by using ODA and EDIIS algorithms
- Led collaborations between a theory group at UC Berkeley and an STM experiment group at Princeton University; resulted in a publication, conference presentations, and experimental verification of simulation data
- Developed a software package to detect spatial features and statistical correlations in noisy experimental image-data; proposed a novel peak-finding algorithm that combines SVD-, PatchMatch- algorithms and Fourier-crystallography

Research Assistant   2016-2017
Observational Cosmology Lab, Princeton University   *Princeton, NJ*
- Proposed optimal parameters of a meter-sized toroidal coil for usage as a benchmark magnetometer device to detect smoking-gun signatures of ultralight Axion Dark Matter.

Research Assistant   2013-2015
Computational Physics Lab, Unviersity of Illinois at Urbana-Champaign   *Urbana, IL*
- Constructed deep neural network architecture which can optimally learn the phase diagram of high-pressure hydrogen atoms by training density functional theory (DFT) and quantum Monte Carlo (QMC) calculation data
- Achieved 10^{-1} test-RMSE improvement compared to state of the art results

WORK EXPERIENCE

Teaching Assistant   2016 – 2017, 2021-2022
Princeton University   *Princeton, NJ*
- Served as a graduate teaching assistant for 6 physics courses including Physics for Life Sciences, Quantum Physics
- Organized 10+ meetings to mentor 4 graduate students on a research project in condensed matter theory

SELECTED PUBLICATION

Jung Pyo Hong, Tomohiro Soejima, Michael P. Zaletel, *Detecting symmetry breaking in magic angle graphene using scanning tunneling microscopy* arXiv:2110.14674, *to appear*, Physical Review Letter

SCHOLARHIPS

Samsung Scholarship, Samsung Cultural Foundation | *awarded $50,000 per year for graduate study* (2015-2020)

COURSEWORK / CERTIFICATES

Machine Learning (Coursera, 2022), Deep Learning Specialization (Coursera, 2022), Physics and Mathematics