Kamphol (Best) Akkaravarawong

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AWARDS

Gold medal
42nd International Physics Olympiad

Bronze medal
12nd Asian Physics Olympiad

Leo Felicov fellowship
UC Berkeley's Department of Physics fellowship

Department scholarship
Awarded to 4 first-year Berkeley's physics graduate students

PUBLICATION

4 first-authored papers
See more at my personal website

SKILLS

Data analysis, Data visualization, Markov Chain Monte Carlo, High-performance computing, continuous integration (CI), containerization and virtualization

Programming Laguages
Python • Julia • JavaScript
C • HTML/CSS • LaTeX
Unix commands • shell scripts

Tools/Packages
numpy, scipy, pandas, scikit-learn
Jupyter, PySpark, PyTorch
Docker • Proxmox • Git
Mathematica • MATLAB • Github action

COURSEWORK

Data structures & algorithms
Statistics/Probability
Machine learning
Linear algebra
Multivariable calculus
Differential equations
Statistical mechanics
Quantum mechanics
Quantum Information
Quantum field theory

LANGUAGES

English (fluent), Thai (native), Mandarin Chinese (beginner)

EDUCATION

UNIVERSITY OF CALIFORNIA, BERKELEY | 2016 - 2023

Ph.D. in Physics, Theoretical Condensed Matter physics
Advisor: Professor Norman Yao

MASSACHUSETTS INSTITUTE OF TECHNOLOGY | 2012 - 2016

B.S. in Physics
GPA: 5.0/5.0

EXPERIENCE

INTERIM POSTDOC RESEARCHER

Lawrence National Berkeley Lab & UC Berkeley | Jun 2016 - Present

GRADUATE STUDENT RESEARCHER

UC Berkeley, CA | Aug 2016 - Jun 2023

Modeling projects: I utilized the quantum field technique to understand the effective interaction between magnetic atoms on a thin-film superconductor.

- Performed complex calculations to obtain closed-form expressions of the effective interactions and estimated the error bound (the high-order perturbation theory).
- Developed a new measurement technique utilizing microwave spectroscopy and collaborated with experimentalists to design a realistic experimental scheme to create a quantum simulator from such system.

Numerical Simulation and Data analysis project : I implemented Monte Carlo method to understand the effect of random potential on novel quantum phases of matters.

- Developed an end-to-end Monte Carlo engine and data pipeline from scratch in Julia and Python, and deployed parallel MCMC simulations on Slurm clusters to simulate large quantum system (state-of-the-art $\sim$ 30k lattice sites).
- Developed a Monte Carlo update that sped up the simulation time by $\sim$ 300%.
- Analyzed $\sim$ 1.3M clean data points of floats to classify phases of matter, leading to discovery of a novel phase, and prediction of instability in real materials.

GRADUATE STUDENT INSTRUCTOR

UC Berkeley, CA | Aug 2016 - Jun 2023

- I taught 2 advanced *graduate* courses (40 students each) and 3 introductory *undergraduate* course (40 students each).

INTERESTS

Technologies : I am passionate about technologies, both hardware and software, focusing on automation, efficiency, and security.

- Utilized containerization and virtualization to self-host $\sim$15 personal services, such as cloud storage, git server, media streaming and password manager, on my personal Linux servers.
- Automated an encrypted backup solution and maintenance tasks and securely exposed the services to the internet.

Investing : I am fascinated by the complex interaction between players in the market and have been invested in the US stock market since 2016.