ChongXiao (Camus) Wang

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OBJECTIVE

An aspiring physics and mathematics student dedicated to modeling complex physical systems, designing precision experiments, and applying machine learning. Proficient in numerical modeling, advanced mechanics, quantum mechanics, and mathematical analysis. Passionate about contributing to summer research program.

EDUCATION

University of British Columbia (UBC)

B.Sc, Combined Honours in Physics and Mathematics Sep 2022 - Present

Overall GPA: A⁻ 82/100 Physics GPA: 87/100

- **Physics Coursework:** Circuit Analysis & Data Acquisition (99), Computational Physics (96), Dynamics and Waves (94), Relativity and Quanta (87), etc.
- **Mathematics Coursework:** Advanced Calculus II (90), Complex Variables (89), Advanced Calculus I (87), Honours Differential Calculus (87), etc.
- **Honors:** UBC Dean's List (2022-23, 2023-24)

RESEARCH EXPERIENCE

Summer Reading Program about Kakeya Problem May 2023 - June 2023

Research participant

- Collaborated with 5 group members under the supervision of PhD student Charlotte Trainor to explore the Kakeya Problem, a rigorous geometric and measure-theoretic research topic.
- Reviewed 4 seminal papers on geometric measure theory and finite field methods and completed 6 corresponding problem sets covering advanced topics in measure theory, finite fields, and algebraic geometry.
- Delved into the construction of Besicovitch sets through geometric approximation, proving that a needle can be rotated 180 degrees while covering an arbitrarily small area, leading to sets of measure zero.
- Analyzed Dvir's polynomial method in the finite field Kakeya conjecture, exploring how algebraic methods provide pretty solutions to geometric problems and examining open problems in higher dimensions and infinite fields.
- Deepened interpretations of measure theory fundamentals through active involvement in weekly discussions and problem-solving sessions, including σ-algebras, outer measure, and Hausdorff dimension.

SKILLS & RESEARCH COMPETENCIES

Physics Laboratory Skills (Over 156 hours of lab experience) UBC 2022 - present

- Accumulated Hands-on experience with DC and AC circuits, Breadboards, Amplifiers, Transistors, Diodes, Rectifiers, Oscilloscopes, Digital Multimeters, and Function Generators.
- Proficient in applied statistical methods for experimental validation, including chi-square tests, residual analysis, t-tests, and uncertainty quantification, and skilled in curve fitting, error propagation, and hypothesis testing.
- Developed, facilitated, and optimized experimental setups to achieve specific research goals in various experiments. Experienced in presenting results through well-structured reports using LaTeX.

Computational Skills (Comprehensive coursework in 6 specialized courses) UBC 2022 - Present

- Programming languages: Python, DrRacket, MATLAB
- Proficient in Data analysis and visualization, including libraries such as NumPy, SciPy, Pandas, and Matplotlib.
- Skilled in recursive programming, core CS concepts, project design, and code optimization in DrRacket.
- Experienced in applying matrix operations, plotting, recursive operations, and numerically solving differential equations in MATLAB.

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CURRENT RELEVANT COURSEWORK

PHYS 306: Advanced Mechanics In progress (Expect to finish in May 2025)

A comprehensive introduction to classical mechanics, covering Lagrangian mechanics, rigid body motion, coupled oscillators, Hamiltonian mechanics, phase space dynamics, and an introduction to continuum mechanics.

PHYS 304: Introduction to Quantum Mechanics In progress (Expect to finish in May 2025)

A comprehensive introduction to quantum mechanics, covering the general framework of quantum mechanics, particle behavior in one and three dimensions, and an introduction to quantum computation and quantum technologies, including qubits.

MATH 321: Real Variables II In progress (Expect to finish in May 2025)

A rigorous introduction to real analysis, following Rudin's Principles of Mathematical Analysis, Topics include Riemann-Stieltjes Integral, sequences and series of functions, special functions, functions of several variables.

MATH 316: Elementary Differential Equations II In progress (Expect to finish in May 2025)

A fundamental course in differential equations, covering series solutions of ODEs, heat, wave, and Laplace equations, numerical methods for PDEs, Fourier series, separation of variables, boundary value problems, and Sturm-Liouville theory.

PHYS 229: Intermediate Experimental Physics II In progress (Expect to finish in May 2025)

An experimental physics course emphasizes independent experiment design and data analysis. It covers acoustic resonance, cooling mechanisms, uncertainty analysis, modeling, and scientific writing, with formal research papers required.

ADDITIONAL SKILLS & INTERESTS

- Language skills: Mandarin (native speaker), English (Advanced), German (Level A1)
- Sports: Soccer, swimming, badminton, hiking, and surfing
- Music: Saxophone and Vocals
- Board Games: Go (Weiqi) - Amateur 1 *dan* rank, Youth Cup Champion at municipal level
- Video Games: Strategy and puzzle games

PERSONAL WEBSITE

- To learn more about my profile and completed projects, please visit: [https://camus0121-w.github.io]