Ziang Yan

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Education

Imperial College London, Master in Science, Mathematics Oct. 2020 - Present

- Bsc. First Class
- MSc. First class
- Relevant Modules: Lebesgue Measure and Integration, Functional Analysis, Fourier Analysis, Markov Process, Quantum Mechanics, Stochastic calculus and non-linear filtering.

Research Experience

M4R: Axiomatic Quantum Field Theory Oct. 2022 - Present

- Supervised by: Dr. Ajay Chandra, Imperial College London.
- Gaussian Hilbert space, axioms and reconstruction theorems, dynamic Φ_2^4 model.

M2R: Group research on Homogenisation problems Apr. 2022 - Jun. 2022

- Supervised by: Dr. Arianna Giunti, Imperial College London.
- Studied theory of low dimensional homogenisation problem in PDE and using two numerical methods to model 2-D homogenisation behaviour in for
- Conducted 2-D homogenisation simulations using Python, employing Iterative Stencil Loop and Relaxation methods.
- Studied layered media and microscopic structures using homogenisation model.
- Project GitHub Repository

ImpVis Project Oct. 2021 - Dec.2021

- Collaborated with Dr. Jonathan Rackham and Dr. Paul Franklyn from the Department of Materials, Imperial College, to develop educational visualisations for X-ray diffraction concepts.
- Studied 2D and 3D reciprocal spaces and their correlation with diffraction patterns.
- Engineered an interactive visualisation of Ewald's sphere for long wavelength scenarios.

M1R: Interplanetary travel Apr. 2021 - Jun. 2021

- Supervised by: Dr. Frank Berkshire, Imperial College London.
- Explored various transfer orbits including Hohmann orbit for solar system missions and calculated transfer time using Kepler's Third Law.
- Successfully derived an explicit formula for determining transfer and return windows, exemplified by a detailed calculation for a Mars mission trip.

Independent Project on Computational Number Theory Nov. 2020 - Apr. 2021

- Investigated all consecutive sums of prime numbers less than 1.7×10^{10} using python.
- Developed a Python-based implementation of an improved version of Sieve of Eratosthenes and linear sieved.
- Performed analysis of the asymptotic behaviour of consecutive sums of primes, revealing insights into their relationship with Prime number distribution.

Teaching and related experience

Student Panellist, Imperial College London Mar. 2024

- Served as a member of a student panel to interview teaching fellows for pure mathematics at Imperial College London.

Mentor, PSM Programme, Imperial College London Jun. 2023 - Sep. 2023

- Served as a contracted mentor in Problem Solving Matters(PSM) programme at Imperial College London, specialising in fostering problem-solving skills among middle school students.
- Supported students in preparing for mathematics tests and exams, including A-Levels Maths, MAT (Mathematics Admissions Test), and STEP (Sixth Term Examination Paper).
- Conducted tutor sessions for a group of ten students, with a focus on geometry, curve plotting, functions, combinatorics and algebra.

Peer Tutor, Dept. of Mathematics, Imperial College London Nov. 2023 - Present

- Run weekly tutoring session for maths undergraduates in Analysis, Algebra and Probability.
- Prepare weekly extra problem sheets to supplement official problem sheets.

Compilation of Lecture materials Oct. 2022 - Apr. 2023

- Collaboratively compiled a Functional Analysis lecture notes.
- Complied problem sets of Fourier Analysis and Theory of Distribution.

Technical Skills

- Expert in Python and LaTeX, proficient in Wolfram Language and Julia, with intermediate proficiency in Matlab, C, and R.
- Experienced in using Notion and Obsidian for effective information management and project organisation.

Interests and achievements

Member, World Cube Association(WCA) Mar. 2017 - Present

- Able to solve a 3x3 within 10 seconds, a 4x4 in 30 seconds.
- Participation in over 20 WCA cubing competitions, including two national championships.
- Used Group theory to improve understanding of Rubik's cube behaviour and applied group theory methods in Fewest Moves Competitions.
- Official Competition results: WCA personal Profile page

Chair, Imperial Cubing League, Imperial College London Feb. 2023 - Present

- Started a speedcubing society focusing on Rubik's cube in Imperial College London with over 50 members.
- Responsibilities include leading committee discussion, coordinating between sponsors, union, society members and WCA, organising weekly cubing sessions and funding application.

Executive Committee Member, Cubing League UK Sept. 2023 - Present

- Co-founded Cubing League UK, an organisation dedicated to cubers in UK universities, with membership from cubing societies in over 10 universities.
- Served as an executive committee member, with responsibility of monitoring weekly league activities, maintenance of competition result database and building a discord bot for league server.