Kay Thompson

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Education

Ph.D. in Mathematics | University of Illinois Chicago | 2028

B.S. in Mathematics with Highest Distinction | Minor in Physics | University of Illinois Urbana-Champaign | 2022

Training

Internship Network in the Mathematical Sciences (INMAS) | 2023-2024
Working with Python packages including pandas, seaborn, numpy, and others to learn and implement techniques from data science, statistics, and machine learning to analyze large data sets. Gaining experience and knowledge to bridge the gap between academia and industry.

Experience

Instructor | University of Illinois Chicago, Department of Mathematics, Statistics, and Computer Science | Summer 2023
- Led a group of 40 incoming college freshmen through an intensive, 15 hour per week workshop in order to increase their mathematical ability and help them place into higher level courses, with a 98% success rate.

Teaching Assistant | UIC, Department of Mathematics, Statistics, and Computer Science | Fall 2022-Present
- Finite Mathematics for Business (Fall 2023) | Teaching linear algebra, combinatorics, probability, statistics, and basic set theory to business majors with an emphasis on applications to real-world business scenarios.
- Precalculus (Fall 2022, Spring 2023) | Teaching trigonometry, polynomials and rational functions, exponential and logarithmic functions, and other material in preparation for the calculus sequence.
- For both of the above: led 3 sections of 20+ students each semester through weekly worksheets, presentations, and quizzes. Fostered an active learning environment during group work time and prepared short topical lectures for each class. Held office hours both for my students as well as any other students seeking help with mathematics. Graded exams and quizzes.
- College Algebra (Summer 2023) | Led an online discussion section through an expedited version of the course. Held weekly office hours, graded exams and quizzes.

Grader | University of Illinois Urbana Champaign, Department of Mathematics | Fall 2021
- Graded homework and exams of over 70 students in Discrete Mathematics, a course on various areas of mathematics and their applications to computer science. Provided meaningful feedback in a timely manner. Held office hours to assist students with homework, exam preparation, and general understanding of the course material.

Student Lab Worker | UIUC, Department of Physics | Summer 2021
- Assisted in the development of materials for the sPHENIX project at Brookhaven National Laboratory.

Student Researcher | UIUC, Department of Mathematics | Fall 2020-Spring 2021
- Worked with a faculty mentor and graduate students to formalize definitions and theorems from model theory into Lean, an interactive theorem proving language. The work is visible at github.com/vaibhavkarve/igl2020.

Cook | Le Pain Quotidien | Summer 2019-Spring 2020
- Worked in a fast paced, understaffed environment cooking a variety of dishes from memory. Worked both alone and with other cooks to efficiently deal with order surges, and kept the kitchen adequately stocked, prepped, and clean.

Service

OSTEM | University of Illinois Urbana-Champaign | 2020-2022
- Provided guidance on academic and career planning for younger LGBT+ students in STEM.

Hesed House | Aurora, IL | 2011-2020
- Organized a large-scale service project including the donation of over $2,000 in industrial shelving material, then coordinated a team of 15 people to construct shelving in the shelter's warehouse to better organize furniture and home goods designated for residents transitioning to more permanent housing.
- Assisted with meal preparation and serving for dinner services; provided guests with a welcoming, friendly, and familiar environment.

Skills

Programming: Python, Latex, Lean, Haskell, C++
Languages: English (native), Greek (intermediate)
Mathematics:

- Mathematical Logic
  - Model theory and its applications to algebra, geometry, and number theory; stability theory and its connections to combinatorics and machine learning
  - Set theory, computability theory
  - Categorical logic and its connections to type theory
- Algebra
  - Field theory and Galois theory and connections to number theory and algebraic geometry
  - Commutative and homological algebra
  - Linear algebra and its applications throughout mathematics, computer science, and physics
- Analysis
  - Complex analysis and dynamics
  - Measure theory and applications to statistics and probability theory
  - Ordinary and partial differential equations

Physics:

- Quantum Mechanics and Electrodynamics, applications of linear algebra and differential equations to complex problems
- Classical Mechanics, calculus of variations