Curriculum Vitae

Ke Zhang
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EDUCATION

University of California, Riverside **Expected May. 2028**
Ph.D. in Mathematics, GPA:3.66/4.0

Northeastern University, College of Science **Boston, Massachusetts**
MSc in Mathematics, GPA:3.8/4.0 May. 2023
Courses: Algebra 1&2, Computer Algebra, Machine Learning

Arizona State University, School of Mathematical and Statistical Sciences **Tempe, Arizona**
MA in Mathematics (transferred) 08/2021-12/2021
Courses: General topology, algebraic topology

Southwest Minzu University, School of Economic **Chengdu, Sichuan, China**
Bachelor of Economics, GPA: 3.44/4.0 06/2021
Major: Financial Engineering

RESEARCH EXPERIENCE

AI+Math: Transforming Advanced STEM Education for Inland Empire Students
NeurIPS 2025 Workshop — Accepted

- Built Docker images for Lean4 and the agent environment, enabling isolated sandbox execution and reproducible compilation workflows
- Designed and implemented a modular tool-use agent framework for Lean4 formalization of mathematical statements, including development of custom tools stack.
- Implemented automated evaluation pipeline, executing 400+ Lean4 tasks through agent loops under different tool configurations and prompts, and recording compile outcomes, REPL traces, API calling, and tool calling history for comparison across models.

Agent-Based Code Repair System for Gurobi Optimization Models

- Developed a benchmark suite of 26 Gurobi optimization problems (LP, ILP, MIP, QCP, and combinatorial/logistics applications) and implemented 260 unit tests covering feasibility, infeasibility, optimality correctness, and parameter validation.
- Built an automated LLM-based bug generation system, creating reproducible perturbations in Gurobipy code to form controlled debugging cases.
- Constructed a RAG system over the full Gurobi Python API reference, enabling grounded retrieval of function signatures, parameters, model attributes, to reduce hallucination and improve repair accuracy.
- Performed fractional factorial analysis to study the effects of different tool combinations on repair success.

Southwest Minzu University, School of Economics Chengdu, China
Undergraduate Research Assistant 09/2020- 11/2020

- Researched on asymmetric Beta co-movement and market skewness in forecasting Chinese stock market movement
- Independently carried out raw data collection and primary processing and assisted in the programming modeling with STATA and Python
- Studied the operation of clusters in the big data operation and applied the knowledge of the computation of the simulation result

PROFESSIONAL ACTIVITIES

MSRI summer school Moraga, California
Topological Methods for the Discrete Mathematician 07/2022 – 08/2022

- Learning how to use equivariant topology, especially the Borsuk-Ulam theorem to solve problems in combinatorics and geometry
- Discuss with other students open problems in the related field such as the mass partition problem

TEACHING ACTIVITIES

Teaching Assistant, College of Science, University of California Riverside

MATH 005A	Fall 2025
MATH 009B	Spring 2025
MATH 120	Summer 2024
MATH 009A	Summer 2024
MATH 006A	Winter 2024
MATH 007A	Fall 2024

Teaching Assistant, College of Science, Northeastern University

Group Theory (MATH 3175)	Fall 2022
Group Theory (MATH 3175)	Spring 2023

INTERNSHIP EXPERIENCE

ShenWanHongYuan Securities 07/2020 – 08/2020

Intern

Collected research reports and analyzed fundamentals of steam coal in Chinse future market
Computed correlation coefficients (Pearson and Spearman coefficient) with Python and
re-computed the coefficient in different season windows of spot and futures prices with selected factors
Designed the flow and stock factor of steam coal then computed the distribution statistics of factors

COMPUTER SKILLS

Python, C, C++, Docker