Anji Dong

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Profile

- Ph.D. candidate in mathematics specializing in number theory, with strong foundation in mathematical analysis, asymptotic methods, and problem modeling. Experienced in data analysis and machine learning, and comfortable working with complex datasets and abstract models. Interested in applying theoretical and computational methods to practical problems in algorithms, artificial intelligence, and computing.

Education

2022 – now **Ph.D., University of Illinois Urbana-Champaign** Mathematics
Research Area: Number Theory (Advisor: Alexandru Zaharescu)
Cumulative GPA:3.97/4.0.
Shaff-Andrews Fellowship, Wetzel Fellowship

2018 – 2021 **Bachelor of Arts, University of California, Berkeley** Double major in Mathematics and Data Science
Cumulative GPA: 3.97/4.0,
Thesis title: *An Exposition of the Kronecker-Weber Theorem (Advisor: Richard Borcherds)*
Award: *Dorothea Klumpke Roberts Prize owner in Mathematics*

Employment

2024 **Data Analyst.** Biomass Energy Systems Inc.
Designed and developed a data-driven process analysis system using Python (Pandas, NumPy), taking historical process data as input and automatically identifying variable relationships, latent patterns, and trends without relying on engineer-specified formulas, rules, or known relationships.
Built a continuous-learning framework that incorporated new data and validation feedback to iteratively improve relationship discovery, trend analysis, and process prediction.
Collaborated with remote and on-site engineering teams to interpret results and improve system understanding

Employment (continued)

2022 – now **Teaching Assistant.** University of Illinois, Urbana-Champaign.
Independently served as the instructor for a university-level Geometry course in Fall 2025, designing instructional materials and delivering a class session, including organizing course content, presenting theoretical concepts, and leading classroom discussions.
Served as a teaching assistant for undergraduate mathematics courses, grading assignments and providing structured feedback, as well as leading discussion sections in Calculus, Abstract Algebra, and other advanced mathematics courses.

2023 **Lecturer.** ARETEEM Institute.
Designed and delivered curriculum in pre-algebra and calculus for small student groups
Created problem sets aligned with competition-level mathematics (AMC preparation)

Technical Projects

2024 **Natural Language Processing project** INMAS
Applied NLP techniques to build text classification models for spoiler detection
Implemented TF-IDF feature extraction and trained classifiers including XGBoost
Compared performance of different vectorizers and models using standard evaluation metrics
Designed preprocessing and modeling pipeline in Python
Evaluated model performance using standard metrics and compared different approaches

2020 **Gitlet: Version Control System Implementation (Java)**UC Berkeley course project
Built a Git-like version control system supporting commit, branch, merge, and checkout
Designed file storage and version tracking mechanisms to manage history efficiently
Applied object-oriented design and modular architecture for system maintainability

Comparison of SVD Algorithms and Application to PCA. UC Berkeley course project.
Compared and evaluated four SVD algorithms in terms of computational cost and numerical stability for PCA-based image dimensionality reduction and reconstruction.
Implemented numerical methods including the bisection method and bidiagonal reduction in Python
Modified the bisection method with inverse iteration using Steffensen's and Aitken's method, and applied Gershgorin Circle Theorem, to maintain cost as $O(n)$.

Publications

- published 8 papers in peer-reviewed journals including International Mathematics Research Notices (2025), The Ramanujan Journal (2025), Results in Mathematics (2025), Research in Number Theory (2025), Bulletin Mathématique de la Société des Sciences Mathématiques de Roumanie (2025), Aequationes mathematicae (2026).

- 9 additional research papers (preprints or in preparation, 2024–2026)

Skills

Languages
- fluent in Chinese and English, intermediate in Spanish.

Coding
- Proficient in Python (Numpy, Matplotlib, scikit-learn, Pandas), Java, SQL, LaTeX; intermediate in R, Scheme, MATLAB, HTML.