Dian Jin

(608)556-2152 djin38@wisc.edu

EDUCATION

University of Wisconsin-Madison **September 2022 – May 2023 (expected)**
Master in Mathematics *Madison, WI*

University of Wisconsin-Madison **September 2021 – May 2022**
Visiting International Student Program *Madison, WI*

Soochow University **September 2017 – June 2022**
BSc in Mathematics *Suzhou, China*

RESEARCH EXPERIENCE

Undergraduate Thesis: Fourier Analysis and Approximation Theorems **Feb 2022 - May 2022**
***Advisor**: Prof. Shuyun Wei* *Suzhou, China*

- Classified different notions of convergence of a Fourier series.
- Discussed the approximate identities and its relation with convergence.
- Proved the mean square convergence theorem and its generalization to L^p spaces.
- Proved the Weierstrass approximation theorem via the L^p convergence theorem of Césaro sums.

Matrix Factorization and Dictionary Learning **Winter 2022**
***Advisor**: Prof. Hanbaek Lyu* *Madison, WI*

- Studied basic concepts in optimiaztion theory and matrix differentiation.
- Applied *Alternating Least Squares* algorithm and block coordinate descent for matrix factorization.
- Applied matrix factorization for the dictionary learning of the Olivetti face dataset.

ACADEMIC EXPERIENCE

Interdisciplinary Contest in Modeling **2019**
Honorable Mentions (Top 18%) *Suzhou, China*

- Completed the paper "The Louvre Evacuation Model".

Directed Study on Harmonic Analysis **Spring, 2022**
University of Wisconsin-Madison *Madison, WI*

- Studied Hardy-Littlewood maximal functions, singular integrals, Hilbert transforms.

Seminar on Analysis **September 2022 – Dec 2022**
University of Wisconsin-Madison *Madison, WI*

- Studied Hausdorff measures, Frostman's lemma, Hausdorff dimension of projections and distance sets, exceptional projections and Sobolev dimension.
- Gave a presentation on L^2 sphere averages and ball averages of the Fourier transform of a measure.

PhD Qualifying Exam **August 2022**
University of Wisconsin-Madison *Madison, WI*

- Passed the PhD qualifying exam in analysis.

RTG workshop in harmonic analysis **September 2022**
University of Wisconsin-Madison *Madison, WI*

- Attended lecture series on various topics in harmonic analysis, including Fourier extension estimates, oscillatory integrals, spherical maximal functions, etc.

Grader **Fall 2022**
University of Wisconsin-Madison *Madison, WI*

- Worked as a grader for the graduate-level real analysis course (Math 721).

Online Math Education **2020 - present**

- Posted lecture videos of 6 undergraduate courses and 1 graduate-level real analysis (63 hours), with a total of 500, 000 views and are highly praised.
- Currently working on an open source problem set of real analysis, allowing students to edit the LaTeX code to build their personalized problem set.
  (https://github.com/kumiko-euphonium/real-analysis-problem-set-LaTeX)

PRESENTATIONS

Seminar On Analysis **Fall 2022**
University of Wisconsin-Madison *Madison, WI*

- Gave a presentation on L^2 sphere averages and ball averages of the Fourier transform of a measure.

Fourier Analysis (Math 827) **Fall 2022**
University of Wisconsin-Madison *Madison, WI*

- Gave a presentation on the applications of the spectral theorem to Sturm-Liouville problems and Hamburger moment problem.

SKILLS

Programming: MATLAB, Python, C

Toolkit: Sage, NumPy, PyTorch

Framework and Tools: Ubuntu, Git, LaTeX, Jupyter Notebook