

JIANAN (JOHNNY) WU

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Saint Louis, MO 63112

EDUCATION

Washington University in St. Louis

M.S. in Material Science

Advisor: Rohan Mishra

Expected May 2026

Washington University in St. Louis

B.S. in Computer Engineering

GPA: 3.95

May 2025

Grinnell College

B.A. in Mathematics & Physics

GPA: 3.94

May 2024

RESEARCH EXPERIENCES

Point Defect Detection in Bulk Functional Materials

Washington University in St. Louis

Apr 2025 – Present

St. Louis, MO

- Developing a multidisciplinary framework for point defect detection in bulk functional materials by integrating image processing, statistical modeling, and computational materials science.
- Analyzing HAADF-STEM intensities at identified atomic columns to discover point defects with potential integration of a machine learning model trained on (S)TEM image simulations to improve classification fidelity and robustness.
- Applying the approach to hexagonal multiferroic LuFeO_3 to detect antisites and vacancies and validating classification results through comparisons with EELS measurements.
- Building a streamlined and well-tested framework to enable reproducibility and extension to additional functional materials.

Deterministic Matrix Sketching

Grinnell College

May 2023 - August 2023

Grinnell, IA

- Developed deterministic matrix sketching methods using deterministic frames as alternatives to randomized sampling with applications for signal reconstruction in compressed sensing and machine learning, with stable reconstruction guaranteed by theory.
- Investigated seven existing benchmark deterministic frames and identified Paley Equiangular Tight Frames as a provably effective candidate for deterministic matrix sketching with theoretically proven bounds.
- Designed, implemented, and tested MATLAB reconstruction algorithms based on Paley Equiangular Tight Frames.

MENTORING EXPERIENCES

Grader of Linear Algebra and Component Analysis

Washington University in St. Louis

August 2024 - December 2024

St. Louis, MO

Calculus Mentor

Grinnell College

August 2022 - May 2023

Grinnell, IA

Grader of Linear Algebra

Grinnell College

August 2022 - December 2022

Grinnell, IA

Grader of Electromagnetic Theory

Grinnell College

August 2022 - December 2022

Grinnell, IA

RELEVANT SKILLS AND COURSEWORK

Programming Languages

Python, Java, MATLAB, C, C++

Microscopy Tools

HyperSpy, Pycroscopy, Digital Micrograph

Coursework

Electricity and Magnetism, Optics and Wave Physics

Compressed Sensing, Machine Learning, Signal and Systems