

Mara Zwicker

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EDUCATION

Expected Sep 2022 — May 2026

University of Wisconsin - Madison

Geographic Information Systems B.S. with Data Science and Economic Analytics Minors

Division 1 Student Athlete - Wisconsin Women's Rowing Team

WORK EXPERIENCE

Data Intern, Tiny Earth | Madison, WI

10/2023 - Present

- Utilized Python and R to analyze scientific databases, enhancing user interface usability.
 - Cleaned and maintained administrative data using Python and Google Sheets to ensure accuracy.
 - Co-led the complete redesign and successful launch of the organization's new database.
 - Generated Python-based data queries to support grant application processes.
 - Conducted GIS analysis of soil samples, contributing to data-driven insights for research.
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PROJECTS

Machine Learning for Deep-Sea Exploration

03/2025 - Present

- Developing an AI-driven ocean exploration and forecasting platform integrating real-time buoy data, satellite imagery, and weather models.
- Implementing machine learning models for terrain and bathymetric prediction, analyzing seafloor morphology and coastal changes over time.
- Laying the foundation for a broader AI system that integrates additional ocean features: such as currents, salinity, and marine ecosystems, to improve long-term ocean predictions.

Scientific Teaching Course | Tiny Earth

05/2024 - Present

- Updated and improved course content by migrating instructional modules to GitHub
- Conducted citation research to ensure accuracy and credibility of course materials.
- Contributed to the development of instructional objectives and interactive learning activities, emphasizing diversity and equity in STEM education.

Process Mining Algorithm | Tiny Earth

08/2024

- Built Markov models using R libraries (seqHMM, TraMineR) to analyze complex workflows and simulate transitions.
- Applied probabilistic modeling techniques to optimize workflow efficiency and predict outcomes.

Virus and Particle Analysis Tool

05/2023

- Designed and implemented a Python-based program to analyze clustering of magnetic nanoparticles (MNPs) and adeno-associated viruses (AAVs) in microscope images.
 - Utilized OpenCV for contour detection, feature extraction, and shape analysis, incorporating advanced metrics like circularity, aspect ratio, and spatial clustering.
 - Developed custom algorithms to measure distances, identify neighboring particles, and classify MNP clusters based on bonding patterns with AAVs.
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SKILLS

- Python, Java, MATLAB, JSON, Pandas, GeoPandas, Geocoding, Geographic Information Systems (GIS), RStudio, ArcGIS, Data Analysis, Web Scraping, Predictive Modeling, HTML, SQL, Machine Learning, QGIS, Google Earth Engine