

Sheila Whitman

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Graduate research assistant working on computer vision solutions for materials design.

EDUCATION

Aug 2026 **Ph.D. Applied Mathematics** - *University of Arizona, Tucson AZ*
(Expected) Focus: Machine Learning & Computer Vision | National Science Foundation Fellow
May 2023 **M.S. Applied Mathematics** - *University of Arizona, Tucson AZ*
Dec 2020 **B.A. Mathematics** - *Lycoming College, Williamsport, PA*

RELEVANT WORK EXPERIENCE

Aug 2021 **Graduate Research Assistant** - *University of Arizona, Tucson, AZ*
present Accelerating sustainable materials design by utilizing machine learning and vision transformers (ViTs).
Project 1: **Computer vision for material property prediction**

- Utilizing ViTs for feature extraction to perform transfer learning of materials properties.
- Trained polynomial regression models and support linear regression models for property prediction.

Project 2: **Automated segmentation and analysis of melt pools in complex 3D printed metal artifacts [1]**

- Developed a hybrid human-machine learning framework for automated melt pool segmentation in 3D manufactured materials.
- Introduced a new statistical analysis tool as a robust metric for melt pool size analysis, with an additional use for image alignment (Automatically aligned over 900 images).
- Compared the performance of a random forest model and pre-trained CNN model on a large-area artifact.

Jan 2021 **Computational Science Intern** - *National Renewable Energy Laboratory, Remote*
April 2021 Migrated and optimized the existing modeling framework to improve lithium-ion battery design.

- Integrated Neper, an open-source modeling software, into the existing modeling framework to generate computationally efficient and representative grain architectures for lithium-ion battery cathode materials.
- Optimized the numerical framework to extract particle geometries from SEM images and generate high-quality tetrahedral meshes with a focus on improving mesh quality and scalability for large-scale particle modeling.

June 2019 **Computational Science Intern** - *Brookhaven National Laboratory, Upton, NY*
Aug 2019 Developed an interface to improve the user experience of the spectroscopy beamline.

- Created a Python-based Qt Graphical User Interface (GUI) to streamline user interaction and enhance the spectroscopy capabilities of the beamline.
- Streamlined data acquisition processes, contributing to the potential adoption of the GUI framework by other NSLS-II beamlines.

SKILLS

• Python, TensorFlow, Keras, PyTorch, Sklearn, OpenCV, R, MySQL

OUTREACH

2023 - 2024 Brown Bag Student Colloquium Coordinator
2023 - 2024 Mentoring 2 Students in Peer Mentoring Program
2024 Graduate Writing Consultant for the Fellowship Development Program

PUBLICATIONS

[1] **Whitman, Sheila E.**, Hu, G., Taylor, H. C., Wicker, R. B., Latypov, M.I., “Automated segmentation and chord length distribution of melt pools in complex 3D printed metal artifacts.” IMMI (2023).