

# Mira Welner

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GitHub

LinkedIn

## Education

**University of California, Davis**

Computer Science Engineering, BS

September 2018 – June 2022

Overall GPA: 3.4 – Major GPA: 3.5

## Conferences and Presentations

**Sparse Infrared Spectroscopy for Detection of Volatile Organic Compounds** [Preprint]

Mira Welner, Andre Hazbun, Thomas Beechem

**Characterizing Pediatric Hand Grasps During Activities of Daily Living to Inform Robotic Rehabilitation and Assistive Technologies** [Paper]

Marcus Battraw, Peyton Young, Mira Welner, Wilsaan Joiner, Jonathon Schofield

*International Conference on Rehabilitation Robotics (ICORR 2022)*

**A video game system to assess advanced control interfaces for pediatric prostheses** [Poster]

Mira Welner, Jonathon Schofield

*33rd Annual UC Davis Undergraduate Research, Scholarship and Creative Activities Conference (URSCA 2022)*

**Unsupervised Identification of Materials with Hyperspectral Images** [Paper]

Mira Welner

*Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI 2021)*

**Identification of Materials in Hyperspectral Images Using an Autoencoder and ReLU Activation** [Talk] [Poster]

Mira Welner, Aswin Sankaranarayanan

*2021 Virtual Ken Kennedy AI and Data Science Conference*

**Identification of Materials in Hyperspectral Images Using a Convolutional Neural Network-based Autoencoder** [Poster]

Mira Welner, Aswin Sankaranarayanan

*2021 Purdue Virtual Undergraduate Showcase*

**Updating the National Ignition Facility Codebase from Java 8 to Java 11**

Mira Welner, Lyle Beaulac, Mikhail Fedorov

*2019 Lawrence Livermore Laboratory Summer Scholar Poster Symposium*

## Research Roles

**Machine Learning and Biomedical Researcher** | McGowan Institute of Regenerative Medicine

March 2025 – Present

- Employed as a federal contractor by the Veterans Association to work with Professor DeMazumder and his lab
- Developing a digital twin screening system using a Wasserstein GAN with Gradient Penalty (WGAN-GP) and Graph Neural Network (GNN) to predict hidden cardiovascular disease from electronic health records.

**Software Engineering Contractor** | Hermit Tech

February 2025 – Present

- Designing an automatic data pipeline which takes in duckdb data file processes the data to create a SQL file which can be read by evidence.dev to create a dashboard on a publicly accessible site.
- Designing CSS and markdown for use in landing page and documents for client use.

**Bioinformatics Engineer** | Signature Diagnostics

July 2023 – November 2024

- Worked with Dr. Paul Cohen at Signature Diagnostics, an early-stage biomedical startup that develops non-invasive methods of prenatal screening.
- Conducted analyses on RNA-Seq data to determine which classification method and set of genes would yield the best classifier for various genetic diseases.
- Augmented a proprietary algorithm that served as a binary classifier with a data filtering algorithm, transforming the classifier into a multiclass classifier.
- Used RAG to assist LLMs in distinguishing between severe and mild forms of preeclampsia.

**Spectroscopy and Vision Science Researcher** | Purdue University

August 2022 – November 2024

- Collaborated with Professor Thomas Beechem at Purdue University's Mechanical Engineering department to develop a data-lean algorithm that processes spectroscopy data using non-negative matrix factorization to detect contaminants in mediums such as water.
- Wrote and developed figures for a publication describing the processing algorithm for which I am first author; currently in the process of editing and submitting it.
- Served as lead programmer in a mechanical engineering lab. Created a GitHub repository for the lab and instructed lab members on GitHub use.

**Machine Learning and Vision Science Undergraduate Researcher** | CMU

June 2021 – September 2021

- Collaborated with Professor Aswin Sankaranarayanan at CMU Image Science Labs to develop a modified autoencoder, which had the standard convolutional neural network encoder, but the decoder used matrix manipulation, resulting in the hyperspectral image being compressed into its three primary component spectra.
- Presented research at the AAAI Undergraduate Symposium and sole-authored a student paper accepted and presented at the AAAI Conference on Artificial Intelligence.

- Designed a user study for young children utilizing a video game interface connected to a myoelectric detection system and Raspberry Pi 4. Collected and analyzed muscular behavior data using a MATLAB program.
- My research was included in a proposal that successfully earned the lab an NSF grant.
- Received a Provost Undergraduate Fellowship Award and made a poster that was accepted at the Annual UC Davis Undergraduate Research, Scholarship and Creative Activities Conference.
- Co-authored a publication submitted to the IEEE ICORR conference, responsible for designing figures and describing my portion of the programming.

- Updated and refactored the six-million-line Java codebase responsible for operating the National Ignition Facility at Lawrence Livermore National Laboratories.
- Developed and implemented unit tests for specific sections of the codebase that lacked adequate testing coverage.

## Leadership Roles

- Led the UC Davis OneLoop team in the research, design, and manufacturing of the Davis pod for the annual HyperLoop competition.
- Developed the control system programming for the pod using Structured Text.
- Successfully competed in the 2018 OneLoop college competition, earning a spot among the top 21 teams selected to attend the event in Hawthorne.