Mira **Welner**

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Education

University of California, Davis September 2018 – June 2022
Computer Science Engineering, BS Overall GPA: 3.4 – Major GPA: 3.5

Publications

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
Marcus Battraw, Peyton Young, Mira Welner, Wilsaan Joiner, Jonathon Schofield
International Conference on Rehabilitation Robotics (ICORR 2022)

Unsupervised Identification of Materials with Hyperspectral Images
Mira Welner
Thirty-Sixth AAAI Conference on Artificial Intelligence (AAAI 2021)

Posters

A video game system to assess advanced control interfaces for pediatric prostheses
Mira Welner, Jonathon Schofield
33rd Annual UC Davis Undergraduate Research, Scholarship and Creative Activities Conference (URSCA 2022)

Identification of Materials in Hyperspectral Images Using an Autoencoder and ReLU Activation
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
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

Positions

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.

Robotics and Programming Undergraduate Researcher | UC Davis September 2019 – March 2022

- 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.

LLNL Summer Scholar | National Ignition Facility June 2019 – September 2019

- 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.

OneLoop Team Captain | UC Davis September 2019 – March 2021

- Led the UC Davis HyperLoop team, OneLoop 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.