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

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 Sankaranayanan
  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.

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.

Leadership Roles

OneLoop Team President | 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.