

Eric Werner

LinkedIn: [linkedin.com/in/ewernn](https://www.linkedin.com/in/ewernn)

Site: ewernn.github.io

Phone: (916) 990-1029

Email: ewernn@stanford.edu

EDUCATION

- **M.S. in Computer Science, Stanford University** **January 2022- June 2023**
- **B.S. in Engineering Physics, Stanford University** **September 2018- June 2022**
 - **Relevant Coursework:** AI: Machine Learning Principles, Robot Autonomy, Computer Vision, Deep Learning, Natural Language Understanding, Deep Reinforcement Learning, Systems, Probability, Algorithms (non-ML & ML)
 - Physics: Quantum/Advanced/Statistical Mechanics, Signal Processing, EM I & II, Light & Heat, Dynamics
 - Math: Linear Algebra, Multivariable and Integral Calculus, ODEs and PDEs,

RELEVANT EXPERIENCE

- Software Engineer** - Metasense, Sunnyvale, CA **June 2022 - August 2022**
- Wrote sensor fusion algorithm using Kalman filter for pose estimation (C++, Python), used by 13 sensors on human body to visualize movement in 3D for sports training.
 - Wrote jump classifier from accelerometer data, which added z-dimension functionality to the simulation.
 - 3D-printed "clamshell" PCB housing, from CAD to injection molding.

- Circuit Design Engineer** - Flux GmbH, Braunau am Inn, Austria **June 2021 - August 2021**
- Designed overcurrent protection circuit for safe testing of positional encoders (a physical sensor; not ML-related)
 - Implemented into main testing circuit, protecting the research from being destroyed.
 - Relied upon ~500 times/month on for testing new designs and tweaks, as sensor's power goes thru device

- Research Assistant** - Stanford Power Electronics Lab, Stanford, CA **June 2019 - August 2019**
- Designed custom capacitor to research dissipation factor (energy loss) of liquid dielectrics.
 - Presented to ~50 departmental peers. Data used for research on higher density (smaller) transformers.

- Group Leader** - Engineers for a Sustainable World, Stanford, CA **October 2018 - June 2022**
- Led installation of 34 solar panels for a meditation center. Efficiently coordinated three teams.
 - Trained 14 volunteers for repair efforts. Facilitated 10 repair "cafes" to fix people's broken items.

TECHNICAL PROJECTS

Model Free Reinforcement Learning for Robotic Arm on Kitchen Tasks using Visual Transformer (ViT) Encoder

- Improved sample efficiency on Microsoft's VRL3 reinforcement learning framework. To do so, we replaced the basic image encoder (ResNet18) with a transformer foundation model trained specifically for Embodied AI (VC-1) for 5x increased sample efficiency. Added Reinforcement Learning from Prior Data (RLPD) to improve robustness during exploration and increase online finetuning sample efficiency by 1.5x. Collaborated with 1 teammate.

Designed and Trained Autonomous Wheeled Robot

- Coded autonomous robot with ROS to perceive and navigate an environment, stopping at stop signs and visiting pictures of animals in a specific order. Perceived using LiDAR to make point clouds for SLAM (Simultaneous Localization and Mapping), and computer vision for object detection. For navigation, wrote A* for path planning and controllers for trajectory tracking.

Prompt Tuning and Semantic interpretation with an LLM

- Trained and interpreted soft prompts for language understanding tasks using prompt-tuning, a Parameter Efficient Fine-Tuning (PEFT) method. Soft prompts are the pre-trained tokens used as the prompt instead of asking in English. Improved prompting by revising prompts at an embedding (machine) level rather than the english level. Found soft prompts diverge more on harder-to-describe tasks, implying English task description is suboptimal, and prompting on an embedding-level can improve upon fine-tuning accuracy. Analyzed stochasticity and zero-shot transferability of soft prompts. Collaborated with 2 teammates

Finetuned Convolutional Neural Network to play GeoGuessr (image classification)

- Fine-tuned a ResNet50 image classification model by replacing the last 9 (of 50) layers and classifying on 20 different countries (from 38k Google Streetview screenshots). Ran data augmentation and hyperparameter tuning to achieve 72.5% classification accuracy (correctly guessed which of 20 countries 72.5% of the time). Collaborated with 1 teammate.

SKILLS

- **Programming Languages:** Python, C, C++, Java
- **Frameworks:** PyTorch, Tensorflow, Numpy, Scikit-learn, Scipy, Pandas, Matplotlib, Git, ROS