

# Linji Wang

---

Pittsburgh, PA • [linjiw@andrew.cmu.edu](mailto:linjiw@andrew.cmu.edu) • 412-888-6071

## Education

### Carnegie Mellon University

Master of Science in Mechanical Engineering - Research (GPA: 3.9/4.0)

Core Course: Computer Vision, Deep Learning, AI&ML, Deep Reinforcement Learning

### University of Cincinnati (USA) & Chongqing University (China)

Bachelor of Science in Mechanical Engineering (GPA: 3.8/4.0)

Pittsburgh, PA, USA

Sep 2021 – May 2023

Cincinnati, OH, USA

Sep 2016 – May 2021

## Research Experience

### Computational Engineering and Robotics Lab, Mechanical Engineering Department

CMU, PA, USA

#### Research Assistant, Advisor: Dr. Kenji Shimada

Jan 2022 – Present

- Project: 3D AR Scene Inpainting via Deep Learning.
- Developed a pipeline to predict the missing background in 3D AR scenes and trained a Generative Adversarial Network (GAN) model for image inpainting on the Describable Textures Dataset (DTD).
- Designed a projection and texture mapping function for 3D to 2D bidirectional transformation.
- Implemented RANSAC and DBSCAN for plane segmentation of 3D AR scenes and utilized patch match algorithms for image inpainting.

### Biorobotics Lab, Robotics Institute

CMU, PA, USA

#### Research Assistant, Advisor: Dr. Matthew Travers

Sep 2021 – Dec 2021

- Project: Recycle Paper Data Collection and Classification
- Trained and deployed a CNN model using Pytorch to collect and classify recycled paper grade data.
- Model Description: depthwise convolution, residual block, and GELU activation function.
- Developed an auto-sync image/video collection and streaming program with GUI in Python.
- Designed, implemented, and tuned API for a 4K resolution, 24fps machine vision camera in Python with multi-threading for image and video recording.

## Internship Experience

### Beijing Siemens Cerberus Electronics

Beijing, China

#### Research Lab Intern

May 2019 – Aug 2019

- Designed and implemented 3D printing tasks from the structural design team.
- Conducted failure analysis for each failed 3D printing task and model reinforcement to prevent failure of unsupported structures.

#### Software Development Intern

Jan 2018 – Apr 2018

- Developed asset management software in Python to track equipment loan history.
- Designed and developed a Graphical User Interface with PyQt5 to manage user requests.
- Enabled loan history tracking, generated official documents, email alerts, and stock alert features.

## Course Projects

### Flexible Long-Term Mortality Prediction From Radiological Impressions

CMU, PA, USA

#### Course: Introduction to Deep Learning

Jan 2022 – Apr 2022

- Designed a survival analysis model for mortality prediction using radiography images, demographical information, and time-series data.
- Integrated a CNN model into a Cox Proportional Hazards (DCPH) model to extract features from radiography images.
- Model Description: MobileNet-v2 for image feature extraction, fully connected layers for overall feature integration, and Cox Hazard model for life prediction based on time-series data.

### **Attention-based Speech Recognition**

CMU, PA, USA

#### **Course: Introduction to Deep Learning**

Jan 2022 – Apr 2022

- Pre-processed speech data and transcripts for neural network input and designed depthwise convolution layer for feature extraction and embedding layers.
- Developed self-attention mechanisms and implemented locked dropout for each LSTM layer.
- Results: Levenshtein distance (8.6); reached an A score in the Kaggle competition.

### **Face Classification and Recognition**

CMU, PA, USA

#### **Course: Introduction to Deep Learning**

Jan 2022 – Apr 2022

- Developed residual blocks from scratch to implement ResNet for classification and utilized center loss to increase the performance of face recognition.
- Results: classification (0.86 accuracy); recognition (0.85 accuracy); A score in Kaggle competition.

### **3D Reconstruction Project**

CMU, PA, USA

#### **Course: Introduction to Computer Vision**

Sep 2021 – Dec 2021

- Implemented an 8-point algorithm to estimate the essential/fundamental matrix and utilized RANSAC for overall triangulation and optimization of 3D reconstructions.
- Results: Created 3D visualization from two stereo-pair images by using homographic transformation.

### **Augmented Reality with Planar Homographies**

CMU, PA, USA

#### **Course: Introduction to Computer Vision**

Sep 2021 – Dec 2021

- Developed feature extraction and matching algorithms using BRIEF descriptors and FAST detectors.
- Performed homography calculations using RANSAC and standardization.
- Results: Achieved augmented reality by warping images into real-time videos with homographic transformations.

## **Teaching Experience**

### **College of Engineering, Carnegie Mellon University**

Pittsburgh, PA, USA

#### **Teaching Assistant**

Sep 2022 – Present

- Course: Artificial Intelligence and Machine Learning

### **College of Engineering and Applied Science, University of Cincinnati**

Chongqing, China

#### **Teaching Assistant**

Jan 2020 – Apr 2020

- Course: System Dynamics and Vibrations, Fluid Dynamics, Engineering Models

## **Skills**

**Deep Reinforcement learning:** OpenAI Gym (MC-TD, Deep Q-Learning, SARSA, MCTS, Actor-Critic)

**Computer vision:** OpenCV, Pytorch

**Deep learning:** Pytorch (MLP, CNN, RNN, LSTM, Seq2Seq, Transformer, GAN)

**Cloud computing:** AWS, GCP, Linux

**Programming technologies:** C, C++, Python, Java, MATLAB