Linji Wang

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Education

- **George Mason University | Ph.D. in Computer Science**   **(Sep 2023 – May 2027 | Fairfax, VA)**
  - ✓ Admitted as an incoming Ph.D. Student in CS
- **Carnegie Mellon University | MSc in Mechanical Engineering**   **(Sep 2021 – May 2023 | Pittsburgh, PA)**
  - ✓ GPA: 3.94/4.0 (98.5%)
  - ✓ Core Courses: Machine Learning, Deep Learning, Computer Vision, Deep Reinforcement Learning & Control
- **University of Cincinnati | BSc in Mechanical Engineering**   **(Sep 2016 – May 2021 | Cincinnati, OH)**
  - ✓ Joint program with Chongqing University - China
  - ✓ GPA: 3.88/4.0 (97%)

Research Experience

- **<u>Computational Engineering and Robotics Lab</u> | Research Assistant**   **(Jan 2022 – Present | CMU, PA)**
  - ✓ Worked on ***3D Augmented Reality (AR) Scene Inpainting via Deep Learning*** research project under the supervision of <u>Dr. Kenji Shimada</u>
  - ✓ Developed a pipeline to predict the missing background in 3D scenes and trained a Generative Adversarial Network (GAN) model for image inpainting on the Describable Textures Dataset (DTD)
  - ✓ Designed an efficient projection and texture mapping function for 3D to 2D bidirectional transformation
  - ✓ Implemented RANSAC and DBSCAN for plane segmentation of 3D point cloud and utilized patch match algorithms for image inpainting
- **<u>Bio-robotics Lab</u> | Research Assistant**   **(Sep 2021 – Dec 2021 | CMU, PA)**
  - ✓ Worked on ***Recycle Paper Data Collection and Classification*** research project under the supervision of <u>Dr. Matthew Travers</u>
  - ✓ Trained and deployed a CNN model using PyTorch to collect and classify recycled paper-grade data
  - ✓ 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 muti-threading for image and video recording

Teaching Experience

- Teaching Assistant (TA) of Deep Learning at Carnegie Mellon University   **Spring 2023**
- Teaching Assistant (TA) of Artificial Intelligence and Machine Learning at Carnegie Mellon University   **Fall 2022**
- Teaching Assistant (TA) of System Dynamics and Vibrations at the University of Cincinnati   **Winter 2020**
- Teaching Assistant (TA) of Fluid Dynamics at the University of Cincinnati   **Winter 2020**
- Teaching Assistant (TA) of Engineering Models at the University of Cincinnati   **Winter 2020**

Work Experience

- **Beijing Siemens | Research Lab Intern**   **(May 2019 – Aug 2019 | Beijing, China)**
  - ✓ 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
- **Beijing Siemens | Software Development Intern**   **(Jan 2018 – Apr 2018 | Beijing, China)**
  - ✓ Developed asset management software to track equipment loan history using Python
  - ✓ Designed and developed a Graphical User Interface with PyQt5 to manage user requests
  - ✓ Enabled loan history tracking, and generated official documents, email alerts, and stock alert features

Major Projects

- **MuZero Implementation for CartPole-v0 | Reinforcement Learning**
  - ✓ Implemented a non-parallelized version of the MuZero algorithm for the OpenAI Gym CartPole environment
  - ✓ Utilized TensorFlow for modeling policy, states, and environment dynamics, while alternating between experience collection and network training in a single thread
- **Model-based Reinforcement Learning with PETS | Reinforcement Learning**
  - ✓ Implemented a model predictive control for Box2D environment, achieved 0.86 success rate with a 49% performance improvement compared to open-loop control

- ✓ Trained and optimized a single probabilistic network for modeling environment dynamics with the cross-entropy method
- ✓ Assembled multi-probabilistic networks to create uncertainty-aware dynamics models, and reduced aleatoric and epistemic uncertainty
- **Flexible Long-Term Mortality Prediction from Radiological Impressions | Deep Learning**
- ✓ Designed a survival analysis model for mortality prediction using radiography images, demographical information, and time-series data
- ✓ Integrated a CNN MobileNet v2 model into a Cox Proportional Hazards (DCPH) model to extract features from radiography images
- **Attention-based Speech Recognition | Deep Learning**
- ✓ Pre-processed speech data and transcripts for neural network input, designed depthwise convolution layer for feature extraction and embedding layers, and ranked A in Kaggle
- ✓ Developed self-attention mechanisms and implemented locked dropout for each LSTM layer
- **Face Classification and Recognition | Deep Learning**
- ✓ Developed residual blocks from scratch to implement ResNet for classification and utilized center loss to increase the performance of face recognition
- **Augmented Reality with Planar Homographies | Computer Vision**
- ✓ Developed feature extraction and matching algorithms using BRIEF descriptors and FAST detectors
- ✓ Performed homography calculations using RANSAC and standardization
- ✓ Achieved Augmented Reality by warping images into real-time videos with homographic transformations

Skills

- **Programming Languages:** C, C++, Python, Java, MATLAB
- **Framework:** PyTorch, Tensorflow, Keras, OpenAI Gym, OpenCV, ROS,
- **Tools:** AWS, GCP, Linux, Docker, NumPy, Pandas, Scikit-learn