

ZIXUAN PAN

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EDUCATION

University of Michigan

Master in Electrical and Computer Engineering, GPA: 3.93/4

Ann Arbor, MI, United States

Aug. 2023 – Present

University of Michigan

Bachelor in Computer Science Engineering, GPA: 3.79/4

Ann Arbor, MI, United States

Sep. 2021 – Apr. 2023

Joint Institute University of Michigan - Shanghai Jiaotong University

Bachelor in Electrical and Computer Engineering, GPA: 3.51/4

Shanghai, China

Sep. 2019 – Aug 2023

RELEVANT EXPERIENCE

Research Assistant at University of Michigan

University of Michigan

May 2022 – Aug. 2023

Ann Arbor, MI, United States

- Worked with Professor Andrew Owens on several topics mainly focused on improving self-supervised learning.
- Did projects on improving vision-language pretraining with cluster-based masking, and energy-based model for video understanding and frame generation.

Instructional Aide at University of Michigan

University of Michigan

Aug. 2022 – Apr. 2023

Ann Arbor, MI, United States

- Working as teaching assistant for EECS 442 and 504 (Foundations of Computer Vision) for two semesters.
- In charge of devising problem sets, holding regular discussion sessions and office hours.
- Designed three coding problems about style transfer, multimodal learning with CLIP and diffusion model. Helped designed several exam problems.

Internship at Shanghai Jiaotong University XLANCE Lab

Shanghai Jiaotong University

Dec. 2020 – May 2021

Shanghai, China

- Worked on vocoders, a generative model mapping mel-spectrograms to waveforms, advised by Professor Kai Yu.
- Wrote a review on prevalent vocoders
- Gained signal processing, cutting-edge techniques in deep learning, and basic knowledge about text-to-speech synthesis.

PUBLICATIONS

Zihao Wei*, **Zixuan Pan***, Andrew Owens. Masking Clusters in Vision-Language Pretraining.

Computer Vision and Pattern Recognition (CVPR), 2024.

- Our method improves vision-language pretraining by masking random clusters of image patches, leveraging visual similarities in raw RGB values. This strategy merges the efficiency of random masking with the effectiveness of semantic masking, meanwhile eliminating the need for complex additional models.

PROJECTS

3DScan: An IOS app based on Neural Radiance Field

May 2023 – Aug 2023

- Developed an IOS mobile app that applies Neural Radiance Field algorithm to generate 3D models and novel views for AR Placement and sharing. In this project, I was responsible for the frontend-backend connection, as well as data collection and preprocessing from camera extrinsic and intrinsic matrices.

Understanding the success of mask image models

Oct 2022 – Feb 2023

- Deep Learning Theory course project. Proved mask modeling is similar to a patch-wise contrastive learning based on spectral clustering features of input image, where low-rank reconstruction loss function and Transformer architecture are essential for the success.

Energy Based Models for Conditional Video Frame Generation

May 2022 – Mar 2023

- Using energy based model for adjacent frame generation as well as learning a better frame representation. I proposed a new energy function for Contrastive Random Walk, aiming at realizing motion-aware conditional generation with videos.

Discovering Intrinsic Reward with Contrastive Random Walk

Feb 2022 – May 2022

- Reinforcement Learning course project. Designed a new method to define intrinsic rewards in unsupervised Reinforcement Learning. Our method borrows ideas from the vision side, which encourages the model to learn better representation when defining intrinsic rewards.

PROGRAMMING LANGUAGES

- Python, PyTorch, Taichi, Swift, C++