Zhaoying Pan

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Education

University of Michigan — Ann Arbor, USA
Master of Science in Electrical and Computer Engineering — *Sept. 2021 - May. 2023 (expected)*

- GPA: 4.0/4.0, Specialization: Computer Vision
- Advisor: Prof. Andrew Owens

University of Chinese Academy of Sciences — Beijing, China
Bachelor of Engineering in Electronic and Information Engineering — *Sept. 2017 - Jun. 2021*

- GPA: 3.59/4.0
- Advisor: Prof. Xian Sun, Prof. Kun Fu

Publication

- Zhiqiang Yuan, Wenkai Zhang, Chongyang Li, **Zhaoying Pan**, Jialiang Chen, Yongqiang Mao, Shuoke Li, Hongqi Li, Xian Sun."Learning to Evaluate Performance of Multi-modal Semantic Localization." IEEE Transactions on Geoscience and Remote Sensing, 2022.
- Jinzhe Liu, Zhiqiang Yuan, **Zhaoying Pan**, Yiqun Fu, Li Liu, Bin Lu. "Diffusion Model with Detail Complement for Super-resolution of Remote Sensing." Remote Sensing, 2022.
- **Zhaoying Pan***, Jinge Ma*. "Face Animation with Multiple Source Images" (* equal contribution), arXiv 2022.

Research Experience

Motion Magnification — May. 2022 - Present
Research Associate Project at University of Michigan — *Advisor: Andrew Owens*

- Implemented an unsupervised approach for motion magnification with a sinusoidal representation network using a single example as a toy example.
- Demonstrated the effectiveness of using optical flow to guide the generation of magnified frames.
- Currently implementing and training the unsupervised approach with models and datasets to predict the magnified frames with large magnification factors.

Artwork Space Exploration — Apr. 2022 - Present
Preliminary Research with Jinge Ma and Yutong Xie — *Advisor: Qiaozhu Mei*

- Applied auto-encoder, CLIP, and artCLIP to construct the artwork space and mined the space with dimensionality-reduction methods including PCA and UMAP.
- Created visualization of artwork embeddings with style labels. Examined and understood the relationship between different clusters of artwork.
- Currently studying the artwork space with the text space of the text-to-image models, including DALL·E 2 and Stable Diffusion.

Face Animation with Multiple Source Images — Oct. 2021 - May. 2022
Independent Research — *Collaborator: Jinge Ma*

- Collected high-quality representative videos to construct an evaluation set for face animation.
- Proposed a flexible animation method enabling inputs of multiple source images to improve the animation performance of previous models.
- Conducted experiments and user studies to illustrate the superiority of our method over previous methods (Monkey-Net, FOMM, MRAA).

Super-resolution of Remote Sensing Images with Diffusion Model Jan. 2022 - Apr. 2022

Research Assistant Project at Chinese Academy of Sciences *Advisor: Zhiqiang Yuan*

- Participated in the implementation of the diffusion model with detailed complementary mechanisms for super-resolution on remote sensing images.
- Compared the proposed method DMDC with the previous methods (MSRN and DDBPN).

Evaluation Protocol of Multi-modal Semantic Localization Apr. 2021 - Sept. 2021

Research Assistant Project at Chinese Academy of Sciences *Advisor: Zhiqiang Yuan and Xian Sun*

- Involved in collecting the Semantic Localization (SeLo) Testset.
- Participated in comparison of SeLo Performance on different trainsets (Sydney, UCM, and RSICD) and retrieval models (VSE++, LW-MCR).

Image Caption Generating of High-Resolution Remote Sensing Images Nov. 2020 - Apr. 2021

Bachelor's Thesis *Advisor: Kun Fu and Xian Sun*

- Implemented image captioning algorithms, including *Show and Tell*, *Show, Attend and Tell*, Transformer, Attention on Attention (AoA), on three remote-sensing image datasets, Sydney-Captions Dataset, UCM-Captions Dataset, and RSICD Dataset.
- Compared and analyzed the trained models qualitatively and quantitatively to determine the best model for practical application.

Object Detection Implementation Aug. 2020 - Oct. 2020

Summer Research Program at Chinese Academy of Sciences *Advisor: Xian Sun, Kun Fu*

- Reviewed object detection algorithms, including Faster-RCNN, YOLO v3, and YOLO v4.
- Implemented YOLO v3 with PyTorch on the DOTA dataset to detect objects in remote sensing images.

Image Captioning Implementation Jul. 2019 - Aug. 2019

Summer Research Program at Chinese Academy of Sciences *Advisor: Xian Sun, Kun Fu*

- Implemented simple CNN and LSTM with PyTorch and TensorFlow.
- Implemented *show and tell* algorithm on UCM dataset with TensorFlow.

Awards and Honors

Bachelor's Thesis with Honors, *University of Chinese Academy of Sciences* 2021

Academic Excellence Scholarship (second-class), *University of Chinese Academy of Sciences* 2019

Merit Student, *University of Chinese Academy of Sciences* 2018 – 2019

Gold Medal, Best Open Project, *International Genetically Engineered Machine (iGEM) Foundation* 2017 – 2018

Skills

- Programming Languages: Proficient in Python, C, Matlab, and Verilog; Familiar with HTML/CSS.
- Skills: Proficient in neural network implementation, dataset collecting, and reimplementation; Familiar with web scraping and webpage construction.
- Tools: Expertise with PyTorch, OpenCV, Numpy, Pandas, Sklearn, Spacy, PyTerrier, Linux operating system, and LaTeX; Acquainted with TensorFlow.