Jinge Ma

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Education

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

- Major: Computer Vision
- GPA: 4.0/4.0

University of Chinese Academy of Sciences — Beijing, China
Bachelor of Engineering in Electronic and Information Engineering — *Sept.2016 - June.2020*

- Graduation Dissertation: FreeAnchor-based Single Shot Detector
- Advisor: Qixiang Ye
- GPA: 3.4/4.0

Publication and Patent

Qixiang Ye, Xiaosong Zhang, Fang Wang, ***Jinge Ma****, Xiangyang Ji. "A Training Method for Anchor-free Object Detector based on Feature Matching Optimization". Chinese National Patent ZL202010778936.2. China National Intellectual Property Administration. 17 Aug. 2021.*

Jinge Ma*, Zhaoying Pan*. "Face Animation with Multiple Source Images"* (* equal contribution), arXiv 2022.

Tao Yu, ***Jinge Ma****, Guilin Li, Dongyu Yang, Rui Ma, and Yishi Shi. Realization scheme for visual cryptography with computer-generated holograms. International Workshop on Holography and related technologies 2018.*

Research Experience

Compositional Diffusion Model, MIT — May.2022 – Present
Research with Shuang Li and Yilun Du — *Advisor: Shuang Li Joshua Tenenbaum*

- Grounded language understanding with GLIDE
- Decomposed objects in the scene on CLEVR dataset
- Designed a text encoder to learn to the correlation between objects in texts and images

Artwork Space Exploration, UMich — Apr. 2022 - Present
Research with Zhaoying Pan 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. (Workshop in preparation)

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

- 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).

New Training Method with One-stage Detector, CAS Nov.2019 – July.2020
Bachelor's Thesis *Advisor: Qixiang Ye*

- Improved Single Shot Detector with Anchor-Free training method

Image Caption on Remote Sensing Images, CAS Jul. 2019 – Aug. 2019
Summer Research *Advisor:Xian Sun*

- Reimplemented image caption algorithm on remote sensing image dataset with TensorFlow

Medical Image Processing, SJTU Jul. 2018 – Aug. 2018
Summer Research *Advisor: Yiping Du*

- Automatic diagnosis of lung nodules based on Fater RCNN

Course Projects

DeepFake Classification

- Designed and implemented a naive classifier and a Siamese network from scratch to detect DeepFake images.
- Reimplemented an EfficientNet-based classifier with a Siamese-style training strategy.

PhotoShopped Image Classification

- Scraped a raw dataset from the Reddit PhotoShop community.
- Implemented a binary classifier to estimate the likelihood of images being altered by PhotoShop and a location network to calculate the consistency score of image patches in order to detect the altered areas.

Web Interface for Interactive PhotoShopped Image Detector

- Modified the pre-trained model to allow the model output based on user-supplied scale.
- Developed a web interface for a Photoshopped image detection model, with functions including image uploading, image cropping, AI model deployment, and output control through a slider.

Recipe Search Engine (in progress)

- Scraped a dataset from allrecipes.com containing 46000 pieces of recipe information, including title, ingredients, instructions, categories, and nutrition.
- Implemented the search algorithm with the dataset, allowing multiple constraints in the search query.
- Currently developing a web interface for the recipe search engine.

Awards

Outstanding Research Group Leader, *University of Chinese Academy of Sciences* 2019

Technical Skills

Programming Languages: Python, Matlab, C, Verilog

Hobbies: Guitar Fingerstyle, Keeping Birds

Tools: PyTorch, OpenCV, Numpy, Pandas, Sklearn, Spacy, PyTerrier, Linux operating system, LaTeX and TensorFlow.