Jiangtian Pan

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Educational Background

The Ohio State University (OSU)   **08/2017-05/2019**
Master of Science in Electrical and Computer Engineering   **Columbus, OH, USA**

Wuhan University (WHU)   **09/2013-06/2017**
Bachelor of Engineering in Automation   **Wuhan, Hubei, China**
- *GPA:* 85/100 (Ranking in Top 15%).

Scholarships and Awards

Ranked 2nd in the CVPR 2018 Workshop	2018
AI Star Intern in the JD AI Research (10/50)	2018
AAA Graduate Student (10/450)	2017
Interdisciplinary Contest in Modeling (Honorable Mention)	2016
WHU Outstanding Student Leader (2/60)	2015
Avery Dennison Foundation Spirit of Invention Scholarship (10/150)	2014

Academic Publications

Yunhan Huang, Li Ding, Yun Feng, ***Jiangtian Pan***. "*Epidemic Spreading in Random Walkers with Heterogeneous Interaction Radius*", JSTAT 2016(10), 103501.

Research Experience

Computer Vision Researcher, KSvill Research. *Advisor: Dr. Yuzhi Wang*   **07/2021-present**
Focus: Real-Time Video Quality Enhancement for Mobile Devices.
- Proposed a CNN based model, incorporating an attention module, skip connection and residue module.
- Reduced computing FLOPS from 330GOPs to 12GOPs by implementing a Space2Depth module and distillation and pruning techniques. This reduced the model inference time from 100+ms to 15ms in *Qualcomm Snapdragon 8475*.
- Simulated an ISP pipeline using Poisson noise and Gaussian noise to generate training and ground-truth datasets.
- Proposed a technique for data augmentation that involved the collection of noise from real data.
- Recommended data augmentation approaches, e.g., modifying the brightness, simulating the motion and adding the random disturbing.
- Implemented gradient loss, edge loss and mask loss for performances in corner cases.
- Combined time domain denoising and spatial domain denoising.
- Constructed a pipeline that enabled preprocessing and postprocessing of data to run in the GPU, and model inference to be undertaken in the NPU.
- Effected the installation of this algorithm module in some commercial android devices, e.g., *Xiaomi*, *Motorola*, *Honor*, and *Autel*.

Research Intern, JD AI Research. *Advisor: Dr. Tao Mei*   **05/2018–09/2018**
Focus 1: CVPR Workshop, LIP Contest (Ranked 2nd).
- Augmented the dataset by rotating and reversing images and by using Mask-RCNN to obtain more data from the multi-human dataset.
- Modified and fine-tuned the JPP-Net, SS-NAN, DenseNet, RefineNet, and UPerNet on the LIP training set. This involved combining the five models with fusion strategies and adding key-points to refine the performance.
- Mined several hard classes and improved the overall performance to achieve an 87.42%-pixel accuracy.

Focus 2: Human Parsing via Reinforcement Learning.

- Loaded images from the LIP dataset, using FCN for coarse parsing and SLIC for super-pixel generation.
- Randomly selected one super-pixel to act as the initial seed. This was defined as the initial State.
- Calculated the mean IoU metric between each seed and labelled it as Reward; defined how to merge the near super-pixel for each seed as Action; classified the merged super-pixels in a seed as the present State.
- Used DQN to cause multiple seeds to learn how to label the image autonomously in accordance with the Reward function.

Research Assistant, Wuhan University. *Advisor: Prof. Li Ding*   **05/2015–09/2018**

Focus: *National Natural Science Foundation of China Project*, **The Dynamic Analysis & Optimization of Complex Networks.**

- Researched epidemic spreading in complex networks, involving the reading of academic papers, model construction, data collection, and process simulation.
- Built a Susceptible-Exposed-Infectious-Susceptible (SEIS) Model utilizing adaptive weights determined by graph theory, complex networks, and a Markov chain model.
- Implemented a simulation applying discrete-time Monte-Carlo methods and programing with MATLAB using built-in algorithms and model.
- Evaluated the process to identify the most effective approach to the inhibition of epidemic spreading, based on the SEIS model.
- Conducted graph visualization and data analysis to validate the simulation data in Origin Pro and CorelDRAW.

Professional Experience

Algorithm Engineer, vivo AI Research   **07/2019–06/2021**

Real-Time Frame Interposition and Motion Deblur in Mobile Devices.

- Built a two-stage model based on SuperSloMo for optical flow prediction and frame restoration.
- Reduced model FLOPS by implementing distillation and pruning approaches.
- Proposed an unsupervised learning approach to the train model in Adobe240fps and UCF101 datasets.
- Built a highly parallel computing pipeline by using OpenCL (for GPU computing) and VCap (for NPU computing). This reduced the pipeline period from 150ms/frame to 25ms/frame.

Face Clustering in Digital Album.

- Built a CNN-based extraction model for human facial features.
- Proposed a Graph Clustering Algorithm (GCA) based on graph structure and KNN.
- Implemented a clustering algorithm for the human face based on GCA and cosine distance in smartphones.
- Increased Acc/Recall from 0.92/0.79 (w/o GCA) to 0.99/0.94 (w/ GCA).
- Succeeded in getting the resulting algorithm module installed in **1 million**+ vivo smartphones.

Real-Time Human Segmentation in Mobile Devices.

- Built an Encoder-Decoder model based on UNet and Depthwise Separable Convolution in TensorFlow.
- Augmented the PFCN dataset (18698 images) and the vivo dataset (5000 images) by cropping, flipping, shifting, zooming, and alpha blending 60000+ images.
- Proposed an alpha blending approach to keep inter-frame consistency in process
- Reduced model FLOPS by applying distillation and pruning approaches. The model inference time was decreased from 40ms/frame to 13ms/frame in *Qualcomm Snapdragon 855.*

Additional Information

Proficient in: Java, Python, MATLAB, PyTorch, TensorFlow, TFLite, MegEngine.

Professional Fields: Artificial Intelligence and Computer Vision, Low-Level Vision, Image/Video Quality Enhancement, Real-Time CNN Model Design for Mobile Devices.