

Yutong Wang

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RESEARCH INTERESTS

Computer Vision; Domain Adaptation

EDUCATION

University of Electronic Science and Technology of China (UESTC) 09/2018-06/2022

Yingcai Honors Program of UESTC (An Honors College for Students of Top 2%)

- B.S. in Mathematics-Physics Fundamental Science GPA: 3.81/4.0 (Ranking 5/23)
- Excellent Student Scholarship(Top 4th/23), 12/2019; 3rd Prize, Mathematical Modeling Freshman Competition, UESTC, 6/2019

University of Texas in Austin (UT, Austin) 07/2019-08/2019

Program for Artificial Intelligence & Scientific English (PAISE)

- In the winner team of final project in AI introduction seminar taught by Dr. Junfeng Jiao

SELECTED COMPETITIONS& AWARDS

New Trends in Image Restoration and Enhancement (NTIRE) Workshop and Challenges on Image and Video Processing CVPR'21, Supervisor: Prof. Wen Li 12/2020-03/2021

Winner (Top 1th/125) | Mobile AI 2021 Real-Time Video Super-Resolution Challenge

- Proposed a bidirectional recurrent model same as BasicVSR, and implemented image resize and channel split modules for efficient feature aggregation.
- Trained with a multi-stage method with final Test PNSR **28.33** with the highest Accuracy/Runtime value **8.13**

7th Place (Top 7th/247) | NTIRE 2021 Video Super-Resolution Challenge - Track1. Spatial

- Read and surveyed Video Super Resolution solutions
- Reproduced BasicVSR and EVDR using MMEediting
- Tried to improve BasicVSR considering Optical flow warp sparsity and efficiency
- Tried to solve VSR with heated model Transformer

RESEARCH EXPERIENCE

Learning Invariant feature in Domain Adaptation 05/2021- 11/2021

Research intern | Western University, Canada | Advisor: Prof. Boyu Wang

- Surveyed three Domain Adaptation problems: Conditional shift, Test time training and Label shift
- Settle motivation as delving into covariant shift with covariant assumption satisfied
- Working on learning invariant feature for Domain Adaptation via Disentanglement, achieved SOTA results in Digit dataset.

2021 Video Super Resolution Challenge and Improvement, CVPR 2021 Workshop 12/2020-05/2021

Co-worker and Assistant | Data Intelligence Group, UESTC | Advisor: Prof. Wen Li

- Surveyed the area of Video Super Resolution (VSR) and Got familiar with MMEediting by reproducing 2019 VSR SOTA EDVR
- Wrote and improved BasicVSR, including solving sparsity of warp optical flow by MeshFlow and enhancing aggregation of model features with multi-layer structure
- Tried to improve BasicVSR considering efficiency, sparse optical flow warp and attention;
- Improved BasicVSR with Multi-Layer and Gap structure, aiming at more efficient and effective feature aggregation using Optical Flow (After challenge)
- Utilized Transformer in VSR, combining Optical flow information with spatial-temporal attention.

Data Intelligence Group, UESTC, China

10/2019-Present

*Under the supervision of Prof. Lixin Duan and Prof. Wen Li***Project 4: Image to Image Translation**

10/2020

- Surveyed the classic Image to Image translation methods including CycleGAN, U-net, MUNIT,....
- Rewrote CycleGAN with Pytorch, and then later reproduce with MMEditing with good visual output images.
- Explored the problem of negative style transfer mentioned in CycleGAN using Domain adaptation and Segmentation knowledge
- Studied GAN-related and discrepancy related knowledge mentioned in the I2I translation paper and did corresponding experiments.

Project 3: Domain adaptation Object detection

07/2020

- Surveyed the area of Transfer Learning, especially Domain adaptation; Studied the methods and theory
- Read and Reproduced the paper "Domain Adaptive Faster R-CNN for Object Detection in the Wild" with experiment on **all** the mentioned settings, especially on Normal to Foggy with ablation studies;
- Replaced the VGG backbone with Resnet-50 and obtained **41.25** mAP on Normal to Foggy setting.
- Surveyed recent works of CV tasks under domain adaptation

Project 2: Object Detection Classic Models

05/2020

- Surveyed classic CNN models and reproduced Resnet using Pytorch with a complete experiment on Cifar-10; Trained on cpu for 40 Epochs with 85.27% accuracy on test data.
- Surveyed object detection solutions and reproduced Faster-RCNN using Maskrcnn Benchmark and Yolo v3 from a high-starred github project. ; Rewrite Faster-RCNN and reproduced on PASCAL VOC dataset with mAP 71.3 as reported in the original paper.
- Studied two main streams in Object Detection: One-stage methods: Yolo related and Two-stage method: RCNN related with their corresponding algorithm details.

Project 1: Machine Learning and Computer Vision Basics

10/2019

- Took the course Machine Learning by Andrew Ng and implemented classic ML algorithms like KNN and SVM
- Took the online course CS231n 2019 from Stanford lectured by Feifei Li and finished the given assignments(reported to supervisor Lixin Duan)
- Read several introduction paper of CNN and Computer Vision tasks like Object Detection

ACADEMIC HIGHLIGHT**Reproduction & Improvement Deep Reinforcement Learning Algorithms**

05/2021

- Read through NoiseDQN: Parameter Space Noise for Exploration from OpenAI; Reproduced RL-Restore and replaced epsilon- greedy with Parameter Noise in RL-Restore through TensorFlow; Installed Tensorflow-1 independently

Plate recognition with OCR and Digital Image Procession knowledge

11/2020

Under the supervision of Prof. Zhengming Peng, Image Detection and Intelligence Perception Lab

- Implemented object recognition algorithms to detect plate; Implemented OCR method to extract plate characters from selected plate area

Classic Machine Learning algorithms reproduce and Naive CNN implementation

09/2020-01/2021

Under the supervision of Associate Professor Yazhou Ren, SMILE Lab

- Implemented Machine Learning algorithms for Image Classification task, including KNN, Random forest and SVM; Implemented naive CNN with SGD backpropagation to solve a image classification problem using data from the Class supervisor

TECHNICAL SKILLS

- Programming Language: Python(2.5yrs) ,C(3yrs) ,MATLAB (2.5yrs), SQL(1.5yrs),
- Frameworks: Pytorch (2.5yrs), MegEngine (0.5 yrs), Tensorflow (0.5 yrs)
- Software: Pycharm, VS Code, Xshell, MySQL, Matlab