

TIMING YANG

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EDUCATION

Dalian University of Technology, Dalian, China

09/2018-07/2022

Bachelor of Science in Electronic Information Engineering expected in 2022; GPA 86.9/100

Core Modules: Machine learning (98); Data Structure (94); Digital Image Processing (90); Computer Principles (90); Digital Signal Processing (88); C Language (88)

Selected Honors:

- The Intelligent Algorithm Contest Finalist Award in Underwater Object Detection (National); (05/2021)
- Outstanding Contribution on Voluntary Work by School of Information and Communication Engineering at DUT; (12/2019)
- Second Prize Scholarship (Top 20%) by DUT; (11/2019)

Computer Proficiency: python(3yrs), C(2yrs), matlab(2yrs), Verilog(1yrs), Asm(1yrs)

PUBLICATION

Chen J, Tao L*, **Yang T**, et al, *Mask R-CNN based deep learning analysis on in-situ measured crystal images with automatic dataset labelling*, published on the 41st Chinese Control Conference and submitted to ISTP and EI 04/2022

Yang T, Chen J, Qi Meng, *Optimized methods for online monitoring of L-Glutamic Acid Crystallization*, published on CONF-SPML 2021 and submitted to EI and CPCI 08/2021

Yang T, *Supervised Sliding Window Smoothing Loss Function Based On MS-TCN for Video Segmentation*, published on the 3rd CONF-CDS and submitted to EI and Scopus 06/2021

SELECTED PROFESSIONAL EXPERIENCE

Undergraduate Thesis Project few-shot learning

12/2021-06/2022

DLUT_VLG at Dalian University of Technology

Advisor: Prof. Peihua Li

- Learn the basics of few-shot learning.
- Python crawler is used to crawl images to build a dataset, and ResNet is used to clean the raw data.
- Based on the few-shot learning network ReNet, Snapshot Ensembles algorithm and Data Augmentation algorithm, including MixUp, CutMix, RandomErasing, TrivialAugment, etc. are adopted in the training and testing process. Finally, on the CUB-200-2011 and CIFAR-FS public datasets under 1/5-shot settings, the results increased by 4.36%, 2.17%, 3.64%, 2.02%, respectively. The final performance of the adopted algorithm exceeds the existing single-order model and reaches **SOTA** (State-of-the-art).
- Firstly apply about 10 Transformer models, including ViT, Dino, CCT, Distill-ViT, etc. to few-shot learning, and improved on these basic models. And propose a structural model called Res9ViT (convolution+Transformer). On the public dataset of CUB-200-2011, the proposed model outperforms the few-shot learning ResNet-12 model under 1/5-shot settings, the results increased by 2.4% and 1.2%.

Underwater Object Detection

03/2021-09/2021

IIAU-Lab at Dalian University of Technology

Advisor: Prof. Dong Wang

- For algorithm design, apply Cascade-RCNN in mmdetection as the baseline model, implement Mixup, Deformable Convolutional Networks, Multi-Scale Training and Test, Global Context, Rotation Data Augmentation, Motion Blur, attention mechanism etc. to achieve underwater object detection
- In order to deploy underwater object detection in NVIDIA Jetson AGX Xavier for industrial application, replace the Cascade-RCNN model in mmdetection with yolov5m6 model to improve the speed, speed improved by 7.5 times.

- Apply algorithm design's method combined with bbox confidence and the iou of between predict boxes and ground truth boxes to clean original training dataset, accuracy improved by 4.94% in yolov5m6 model. And apply the yolov5m6 model, based on the algorithm design's method, add focal loss function, senet-attention etc. to detect the underwater target and improve the accuracy by 15.57% in total

This project wins the intelligent algorithm contest finalist award and stands out from over 2000 teams in China Underwater Robot Professional Contest, entering the final of China Underwater Robot Professional Contest and ranking 13 out of 31 teams in finals.

Supervised Sliding Window Smoothing Loss Function Based On MS-TCN for Video Segmentation

Research Assistant in Human Perception Computing (HPC) & AI Lab at DUT

10/2020- 06/2021

Advisor: Associate Prof. Shenglan Liu

- Learn the MS-TCN, MS-TCN++ and ASRF network and found the deficiencies of loss function-TMSE
- Propose a Supervised Sliding Window Smoothing Loss Function (loss function-SSWS) with Pytorch to increase the percentage points of F1@10 in 50salads, breakfast and gtea dataset by 6.60%, 9.20%, 1.57% respectively.
- Apply SSWS to the MS-TCN, MS-TCN++ and ASRF network, all improved by at least 1%

A Deep-Learning Based Online Image Monitoring Method for Crystallization Process 11/2019-12/2021

Research Assistant in the Institute of Advanced Control Technology, School of Control Science and Engineering, Dalian University of Technology

Advisor: Prof. Tao Liu

- Apply both python-opencv combined with the canny algorithm to write the automatic labeling crystal code and semi-automatic labelling methods based on Mask-RNN to reduce human work when generating the dataset
- Datasets are flipped horizontally and vertically to achieve data augmentation. And apply deep learning object detection framework Mask-RCNN to realize crystal recognition and online image monitor
- Write mAP0.5 suitable for crystal recognition to test the recognition effect. And write automatic hyperparameter optimization code to increase the percentage points of mAP0.5 by 6.42%.
- Apply density estimation with kernel function to compute crystal size distribution

For more professional experience, please visit my personal website

INTERNSHIP

Intern, **Matsushita Electrical Software Development (Dalian) Co. LTD** 06/2021-07/2021

- Learn the company's production process and analyzed its technological process and production actions
- Practiced face recognition with Baidu-API, making it display on GUI. Develop the "Shentu" system, a station entry verification system used in epidemic prevention and control, to determine whether passengers can enter the station through face recognition & health code detection

Visitor, **European Fortune 500 Industry Visit-** Cologne & Hamburg, Germany; Paris, France. 07/2019 -08/2019

- Visit the automatic assembly workshop of Airbus, BMW and Mercedes-Benz.
- Investigate the Deutsche Bundesbank investment financial services philosophy
- Investigate the concept of environmental protection and development of Schneider Electric

EXTRACURRICULAR ACTIVITIES

Vice President, Young Volunteers Association of Electrical Engineering Department 04/2019-04/2020

Service hours, 144.5 in total(Volunteer for the Community, Campus recruitment, Marathon)