ZHIYUAN YOU

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EDUCATION

Ph.D. Candidate in Information Eng., The Chinese University of Hong Kong Aug. 2023-

- Supervisor: Professor Tianfan Xue & Professor Chao Dong

M.Eng. with Honor in Mechanical Eng., Shanghai Jiao Tong University Sept. 2020-Mar. 2023

- GPA: 3.76/4.0
- Supervisor: Professor Xinyi Le & Professor Yu Zheng

B.Eng. with Honor in Mechanical Eng., Shanghai Jiao Tong University Sept. 2016-Jun. 2020

- GPA: 3.78/4.0, Ranking: **5/148**
- Supervisor: Professor Xinyi Le
- Summer Exchange to *Columbia University* in 2018

HONORS & AWARDS

- **Excellent Master Dissertation** 2023
- **Outstanding Graduate (Postgraduate)** 2023
- **National Scholarship** 2022
- **Outstanding Graduate (Undergraduate)** 2020
- **ABB Scholarship** 2017, 2018, 2019
- **Tingya Scholarship** 2019
- **First Prize in Shanghai of CUMCM 2018** 2018

INTERNSHIP EXPERIENCE

◆ **Horizon Robotics | Perception Algorithm** AI Researcher | Dec. 2022-Mar. 2023

Leader: Marvin Yu, Director of the Perception Group

- **Task**: Improving the FCOS-based baseline to detect objects including *cars, car rears, pedestrians, & cyclists*.
- **Innovation**: (1) Changed the processing method of homologous objects (pedestrians in cyclist detection) from *ignorance* to *abandon*, which solved false positives on homologous objects. (2) developed *crop around GT & FP* strategy, using FP (high-score false positives in the previous version) to improve recall and suppress FPR. (3) verified nearly 10 data augmentation strategies, and finally chose *randomcrop + mosaic (90%) | mixup (10%) + colorjitter* as the final strategy.
- **Outcome**: Increased by **~20%** in driving scenarios, **surpassing and replacing** existing mono products.

◆ **SenseTime | Anomaly Detection, Few-Shot Learning** AI Researcher | Dec. 2020-Nov. 2022

Leader: Kai Yang, Senior AI Engineer

- **Task**: Anomaly Detection. Using *only* normal samples to train a model to detect anomalies.
  Innovation: a) Proposed transformer-based anomaly detection models including *ADTR* & *UniAD*, which includes *layer-wise query decoder*, *neighbor masked attention* & *feature jittering* to suppress the "identity shortcut". b) Successfully extended the *one-model-one-class* method to the *one-model-all-classes* method. c) Designed *push-pull loss* to be compatible with a small fraction of anomalies to increase performance.
  Outcome: Academically (*MVTec-AD & CIFAR-10 datasets*) reached **SOTA**. Validated in **6 projects**, and deployed in **2 projects** (high-speed rail quality inspection & auto parts quality inspection), becoming the key

algorithm of *Shenquan Industrial Training and Inferring Platform*. **3 papers & 4 patents**.

- **Task**: Few-Shot Counting. Using *only* 1-3 examples, counting *any* class of dense objects in an image.
  Innovation: a) Proposed *SAFE-Count* module, encoding similarity into features on the premise of maintaining the spatial structure, enhancing the representations of features. b) Designed *example norm* and *spatial norm* to prevent training divergence.
  Outcome: Academically (*FSC-147 dataset*) reached **SOTA**. **1 paper & 2 patents**.

PUBLICATIONS

- **Z. You**, L. Cui, Y. Shen, K. Yang, X. Lu, Y. Zheng, X. Le, "A Unified Model for Multi-class Anomaly Detection," in Proc. of the Annual Conference on Neural Information Processing Systems (**NeurIPS Spotlight**), 2022.
- **Z. You**, K. Yang, W. Luo, X. Lu, L. Cui, X. Le, "Few-Shot Object Counting with Similarity-Aware Feature Enhancement," in Proc. of the IEEE Winter Conference on Applications of Computer Vision (**WACV, Oral**), 2023.
- **Z. You**, K. Yang, W. Luo, L. Cui, Y. Zheng, X. Le, "ADTR: Anomaly Detection Transformer with Feature Reconstruction," in Proc. of International Conference on Neural Information Processing (**ICONIP, Oral**), 2022.
- **Z. You**, J. Li, H. Zhang, B. Yang, X. Le, "An Accurate Star Identification Approach Based on Spectral Graph Matching for Attitude Measurement of Spacecraft," Complex & Intelligent Systems, 8(2), pp.1639-1652, 2022.
- L. Chen, **Z. You**, N. Zhang, J. Xi, X. Le, "UTRAD: Anomaly Detection and Localization with U-Transformer," Neural Networks, 147, pp.53-62, 2022.

SERVICES

- **Journal Reviewers**
  IEEE Transactions on Neural Networks and Learning Systems (T-NNLS)
  IEEE Transactions on Circuits and Systems for Video Technology (T-CSVT)
  Pattern Recognition (PR)
  Knowledge Based Systems (KBS)

MISCELLANEOUS

- **Languages** Mandarin (First Language), English (TOEFL 93)
- **Coding** Python, PyTorch, MATLAB, C++
- **Hobbies** Technical Writing, Reading, Geography, Running, Table Tennis
- **Activities** *Founder & President* of *SJTU Lingduzhe Association*
  Leader of Media Team in *SJTU International Office* & *SJTU Youth League Committee*
  Monitor of Postgraduate Class