Chen Sun

1999.03 | TEL: +86-15827617757 | E-mail: sun_chen@hust.edu.com | Github | Personal Website

Research Interests: Deep Learning, Computer Vision, Limited Data Learning

Education

Master in Mechanical Engineering	**GPA:** 90.73/100	**2020.09- present**
***Huazhong University of Science & Technology* (HUST)**	Supervisor: **Prof. Liang Gao**	
B.E. in Mechanical Design, Manufacture & Automation	**GPA:** 88.5/100 (3.89/4.0)	**2016.09- 2020.06**
***Huazhong University of Science & Technology* (HUST)**	Rank 7/33 (Experimental Program)	

Research Projects

➢ Data-Limited Object Detection for Industrial Inspection (2021.07-present)

When training data are few-shot and class-incremental

- A novel Incremental RCNN network is proposed to decouple feature representation and alleviate unstable data quality.
- A knowledge distillation framework is designed for fine-tuning, to achieve a balance between knowledge retention and exploration
- 1 paper under review in IEEE TNNLS

When training data include unlabeled images (1st AI Innovation & Application Competition Industrial Intelligence Track) **[Github] [Slide]**

- Add-on tricks, such as self-attention module, GIOU loss, are deployed on Cascade RCNN for stronger baseline performance
- Self-training with label-denoising and consistency augmentation is designed to exploit unlabeled images in a semi-supervised manner.
- The third prize (8/264) and 1 paper under progress

When collected data have small objects and extra height annotations **[Github]**

- An image blocking operation is utilized to crop large-scale raw images into several input blocks
- A Height-RCNN network is designed to conduct detection and height estimation simultaneously in an end-to-end manner
- 1 patent is applied and 1 paper is accepted in *IEEE CASE 2022*

➢ Automatic Machine Learning and Data Preprocessing (2020.09-2021.06)

For object detection task on under water sonar images **[Github]**

- Unified optimization for augmentation and hyperparameter: search space definition and online reduction, multi-metric evaluation
- Software Implementation: User Interface, Search space definition, File IO, Result visualization
- 1 patent and 1 software copyright are applied.

For fault diagnosis task on imbalanced rolling bearings data

- A hierarchical, tree-structured space is designed to configure combinations of imbalanced preprocessing and classification methods.
- A Bayesian-based hyperparameter algorithm is utilized to search for best configuration

Publications

- *S Ke,* ***C Sun****, L Gao, X Li Open-Set Fault Diagnosis based on Prototype Learning with Dual Category-Classifier. IEEE Transactions on Industrial Informatics* **(IEEE TII) Under Review**
- ***C Sun****, L Gao, X Li, Y Gao.* ***A New Knowledge Distillation Network for Incremental Few-Shot Defect Detection.*** **IEEE Transactions on Neural Networks and Learning Systems (IEEE TNNLS) Under Review**
- ***C Sun,*** *Q Wan, Z Li, L Gao, X Li, Y Gao.* ***Anchor-based Detection and Height Estimation Framework for Particle Defects on Cathodic Copper Plate Surface****.* 2022 IEEE 18th International Conference on Automation Science and Engineering **(CASE)**
- *C Liu, Y Cao,* ***C Sun,*** *W Shen, X Li, L Gao.* ***An Outlier-Aware Method for UWB Indoor Positioning in Non-line-of-sight Situations****.* 2022 IEEE 25th International Conference on Computer Supported Cooperative Work in Design **(CSCWD)**

Honors

Scholarships & Awards:

- First-class Scholarship for Postgraduates, HUST, 2020.09 & 2021.09
- Third Prize of Zhixing Scholarship, HUST, 2021.09
- Merit Postgraduate student, HUST, 2021.09
- Excellent Graduates, HUST, 2019.06

Competitions:

- The First Prize Oral Presentation Winner and Outstanding Poster Award Winner in the IEEE CASE 2022 student event, 2022.08
- ***Mathematical Modeling Stars Nomination (Top 12 of all)*** in **the 18th China post-graduate mathematical contest in modeling**, 2022.05
- The third prize (8/264) in the **1st AI Innovation & Application Competition Industrial Intelligence Track**, 2021.12

Professional Skills

- **Language**: CET4：638；CET6：621；TOEFL：109（L: 29, R:30, S:22,W:28）GRE: 329 (V:160, Q:169, W:3.5)
- **Programming**: Python, MATLAB, C++
- **Skills**: PyTorch, TensorFlow, Photoshop, AutoCAD, SOLIDWORKS