Chen Sun

E-mail | Personal Website | Github

Education

Huazhong University of Science & Technology (HUST) **GPA:** 90.73/100 *Hubei, China*
Master in Mechanical Engineering Supervisor: **Prof. Liang Gao** **2020.09- 2023.06**
Huazhong University of Science & Technology (HUST) **GPA:** 88.5/100 (3.89/4.0) *Hubei, China*
B.E. in Mechanical Design, Manufacture & Automation Rank 7/33 (Experimental Class) **2016.09- 2020.06**

Research Interests

- *Data-Efficient Learning*: Overcome learning with imperfect data in the wild, such as few-shot, incremental or open-set data.
- *Transfer Learning*: cross-domain classification and detection in real-world, such as autonomous driving or quality inspection
- *Robot-assisted Industrial Inspection*: vision inspection with robots for multi-view objects with high-resolution

Publications&Manuscripts

(**J** for Journal, **C** for Conference)

[J-1] **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

[J-2] 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-1] **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)***

Research Projects

➢ ***Adaptive adversarial mean-teacher for cross-camera object detection*** **(2022.06-present)**

- Domain shifts are main problems in cross-domain detection, especially scale mis-alignment and style mis-alignment.
- A Class-wise, adaptive strategy is designed for threshold for pseudo label generation in self-learning
- Multi-scale adversarial learning with consistent loss is designed at the stage of RPN for high quality proposals
- Experiments on PCB Inspection and autonomous driving data (Cityscape2Kitti) prove the effectiveness of method

➢ ***Incremental Few-shot Object Detection for Industrial Inspection*** **[Github]** **(2022.01-2022.05)**

- For incremental few-shot data, deep learning models may face catastrophic forgetting and misclassification problems.
- A knowledge distillation framework is designed for fine-tuning, to balance between knowledge retention and exploration
- A novel Incremental RCNN network is proposed to decouple feature representation and alleviate unstable data quality.
- Proposed method gets state-of-the-art performance under several few-shot scenes on public industrial inspection dataset.

➢ ***Multi-task visual learning with extra-supervision label for high resolution images*** **[Github]** **(2021.10-2022.12)**

- Particles on cathodic copper plate surfaces are recorded with their labels, locations and heights using high resolution camera.
- A Height-RCNN with extra label assign network is used to conduct end-to-end detection and height estimation
- An image blocking operation, based on the sparse distribution of objects, is utilized to crop raw images into several blocks

Honors

Scholarships & Awards:

- First-class Scholarship for Postgraduates of HUST, 2020.09 & 2021.09 & 2022.09
- Merit Postgraduate student of HUST, 2021.09
- Excellent Graduates of HUST, 2019.06

Competitions:

- **First Prize Oral Presentation Winner&Outstanding Poster Award Winner** of IEEE CASE student event, 2022.08
- **Mathematical Modeling Stars Nomination** of China Post-graduate Mathematical Modeling Contest 2022.05
- **The third prize (8/264)** of AI Innovation & Application Competition Industrial Intelligence Track, 2021.12

Academic Service

- **Reviewer:** Expert System with Application
- **Conference Volunteer:** BAAI Conference (2020-2022, Excellent Editor)