Keming Jiao

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Education

Lund University *Lund, Sweden*

MSc in Virtual Reality and Augmented Reality *Sept. 2024 - Jun. 2026(Expected)*

Shanghai Jiao Tong University (SJTU) *Shanghai, China*

BEng in Electronic Science and Technology *Sept. 2020 - Jun. 2024*

- **Major GPA**(EE/CS courses):**3.72/4.00**;Overall GPA:3.49/4.00
- **Relevant Coursework and Grades**:Data Structures(A),Machine Learning(A), Thinking and Methodology in Programming (C++)(A), Language Data and Python Techniques(A), Probability and Statistics(A)

Research

Research on Memory Bank-based Image Anomaly Detection *Sept. 2023 – May 2024*

School of Electronic Information and Electrical Engineering, SJTU *Advised by Prof. Chongyang Zhang*

- **Anomaly detection** seeks to examine specific data points and detect rare occurrences which seem suspicious because they differ from the established pattern of behaviors.
- Despite the great progress of anomaly detection technology, the mainstream anomaly detection methods still face the challenge of accurate detection of semantic anomalies.
- Proposed two specially-designed modules: Input-Reference Alignment (I-RA) and **Adaptive Multi-scale Ensembled Scoring** (A-MES).
- Established the**Garment Printing Defects Dataset**, which consists of 36 categories of garment printings and has labeled pixel-level ground regions.
- Our method achieved performance comparable to or even better than SOTA, especially in semantic anomalies and small-scale anomaly detection.

Research on Domain Adaptations in Fault Diagnosis of Roller Bearing *Oct. 2022 – Jun. 2023*

School of Mechanical Engineering, SJTU *Advised by Prof.Jianfeng Tao*

- **Fault Diagnosis** is the system of monitoring and identifying faults as they occur, as well as identifying the type of fault and its location.
- Proposed **a novel semi-supervised prototype network** for solving the **few-shot problem** in TBM main bearing fault diagnosis.
- Designed **a novel dual-stream multi-channel network based on adversarial learning** to solve the **domain- shift**, which means performance degradation caused by different working conditions.
- Our model utilized adversarial learning to narrow the gap between data distributions of different working conditions and the dual-stream multi-channel network to strengthen the performance on TBM main bearing, overall achieving an accuracy of **over 97%**.

Projects

Slay the Spire VR version *May 2024*

Shanghai Jiao Tong University *Video*

- Designed the game mechanics and implemented them in Unity.
- Ported the game to PICO4 VR headset to achieve VR functionality.
- **Technical Skills:** Unity, C#, VR development

Imperial Data Science Online Winter School *Jan. 2023 – Feb. 2023*

Data Science Institute, Imperial College London

- Utilized the natural language toolkit (NLTK) to mine deep information in a COVID-19 paper corpus, performing the tokenization and using deep learning method to **build word representations**.
- Earned honors for the group project as **The Best Overall Project** (top 1 of 8 groups).
- **Technical Skills:** Python with NLTK, PyTorch

Raspberry Pi Camera *Jul. 2021*

Shanghai Jiao Tong University *Video*

- Did hardware design, software development and appearance design to make a camera which could shot and display on an ink-screen.
- **Technical Skills:** Raspberry Pi development, basic interaction design

Publications

Journal Articles

Multi-stream domain adversarial prototype network for integrated smart roller TBM main bearing fault diagnosis across various low rotating speeds

Xingchen Fu, Keming Jiao, Jianfeng Tao, Chengliang Liu

Reliability Engineering & System Safety p. 110284. Elsevier, 2024

A Novel Semi-supervised Prototype Network with Two-stream Wavelet Scattering Convolutional Encoder for TBM Main Bearing Few-shot Fault Diagnosis
Xingchen Fu, Jianfeng Tao, Keming Jiao, Chengliang Liu
Knowledge-Based Systems p. 111408. 2024

Conference Proceedings

Enhanced Anomaly Detection using Spatial-Alignment and Multi-scale Fusion
Keming Jiao, Xincheng Yao, Lu Wang, Baozhu Zhang, Zhenyu Liu, Chongyang Zhang
the 7th Chinese Conference on Pattern Recognition and Computer Vision (PRCV) (Accepted), 2024, Urumqi, China

Scholarship & Awards

2024 **Lund University Global Scholarship**, Lund University *Sweden*
2023 **Undergraduate C Scholarship (top 30%)**, Shanghai Jiao Tong University *China*
2023 **The Best Overall Project**, Imperial Data Science Winter School *UK*
2022 **Undergraduate C Scholarship (top 30%)**, Shanghai Jiao Tong University *China*

Teaching

Teaching Assistant of Thinking and Methodology in Programming (C++) *Fall Semester 2021 & 2022*
School of Electronic Information and Electrical Engineering, SJTU *Instructor: Prof.Jianfeng Tao*
- Designed the course project focused on **Image Edge Detection** using Qt Creator.

Technical Skills

Languages Mandarin(Native), English (**IELTS 7.5**)
Programming C++, C, C#, Python, html, LaTeX
Tools Unity, MATLAB, Qt Creator, PyTorch, labelme, taichi, OpenGL, Photoshop, Premiere