

# Chi Wan

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## EDUCATION

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### Northwestern University

*Master of Science in Computer Engineering*

Evanston, US

09/2024-06/2026

### Northeastern University (GPA: 86.7/100)

*Bachelor of Engineering in Intelligent Manufacturing Engineering*

Shenyang, China

09/2020-06/2024

## PROJECTS

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### Artistic Adversarial Attacks on Salient Object Detection Network

07/2023-08/2023

*Project instructed by Björn Schuller from Imperial College London*

- Adopted optimization-based method to generate a style transferred image
- Proposed a color fusion method to make the generated attack image more natural
- Concluded that these 10 networks had varying degrees of decline in six evaluation indicators on DUTS dataset

### Detection of Rail Surface Defects under Poor Sample

03/2022-03/2023

*Research Assistant, Provincial-level Government Funded Project, Advisor Prof. Kecheng Song*

- Used physical scraping and rust promoter corrosion to produce highly imitated datasets
- Introduced Swin Transformer as the backbone and designed an attention-based multimodal fusion module
- Designed a lightweight network, reduced model size by 3-76 times, and increased running speed by 2-29 times compared with 15 SOTA networks with similar or even better performance
- Designed online detection system of rail surface defects under PyQt5 framework

### Development of High-density Panoramic LIDAR Sensor and Driving Software

12/2023-06/2024

*Graduation project, Northeastern University, Advisor Prof. Hongtai Cheng*

- Designed of a two-axis mechanical structure based on Solidworks for panoramic dense scanning of 2D lidar
- Completed the GM6020 motor and Hesai LiDAR common control based on ROS system.
- Object detection of point cloud maps using PointPillars network based on OpenPCDet framework.

### Online Project-based Learning Program Instructed by Jian Lian from Google

05/2023-06/2023

#### Project 1: Detection of Fraud in Credit Card Transactions

- Extracted some transaction records from the Store, selected essential information items for PCA
- Learned the Sklearn library including data preprocessing, usage of commonly used machine learning algorithms, etc.
- Built a multi-layer perceptron model and achieved a classification accuracy of 99.82% with that after training

#### Project 2: Data Analysis for a Survey of Depression, Anxiety, and Stress Tendencies Based on LightGBM

- Data preprocessing, including encoding strings, deleting malicious data based on the answer time, etc.
- Utilized 3 Sigma Anomaly Detection methods to remove duplicate data and features with significant missing amounts
- Built a predictor for dataset with LightGBM and output negative sentiment levels ranging from 0 to 10

#### Project 3: Reasoning with Open Neural Network Exchange

- Convert saved Tensorflow model weight to the ONNX model
- Grasped the ONNX library to accelerate reasoning process of trained model

## INTERNSHIPS

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### Industrial Video Anomaly Detection

07/2024-present

*Research Assistant, Huazhong University of Science and Technology, Advisor Prof. Wenyong Yu*

- Proposed three-stream feature extractor, containing spatial, optical flow, and fusion features.
- Designed a Time Frame rearrangement agent task based on the periodicity of industrial videos.

### End-to-End Joint Training of World and Agent Models for Unified State-Action Prediction

*Research Assistant, Northwestern University, Advisor Prof. Manling Li*

- Proposed a novel joint training method for generating world and agent model.
- Evaluated two models in different benchmarks.

## MCM/ICM

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### Prediction of Gold and Bitcoin Prices Based on LSTM Networks

02/2022

- Carried out data cleaning to delete some dates without transactions or missing data
- Predict the price of the next day based on the price of gold or Bitcoin for half a month with LSTM Networks

## PUBLICATION & COPYRIGHT

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- **Wan C**, Ma S, Song K. *TSSTNet: A Two-Stream Swin Transformer Network for Salient Object Detection of No-Service Rail Surface Defects*[J]. Coatings. citation:9 (code: <https://github.com/VDT-2048/TSSTNet>)
- Chen Q, **Wan C**, et al. *Dangerous Art Paintings: Artistic Adversarial Attacks on Salient Object Detection*[C] ICCEIC. (code: <https://github.com/NorthForest233/Art>, co-first author)
- Computer Software Copyright Registration Certificate, Fully Automatic Rail Surface Defect Detection System v1.0