

Developing a portable railroad crossing monitoring system based on artificial intelligence and image processing technology

Technology Transfer Activities

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Technology Transfer Activities

1 Outputs

This project outputs two conference presentations detailing a proposed model for railroad crossing monitoring. The model is designed to enhance safety and security at railroad crossings, address the limitations of existing systems, and promote a proactive approach to managing these critical infrastructures.

1.1 Output #1

The initial results of this project were presented at the JRC 2024 Conference, May 15, 2024, held at South Carolina University.

Youzhi Tang, Yu Qian (2024). "Enhanced Railroad Crossing Surveillance based on Hybrid Region-Based Convolutional Network". Joint Rail Conference

1.1 Output #2

The final results of this project were presented at the 3rd Annual C2M2 Fall Conference, August 22, 2024, held at South Carolina University.

Youzhi Tang, Yu Qian (2024). "Developing a portable railroad crossing monitoring system based on artificial intelligence and image processing technology".

2 Outcomes

The primary outcome of this research is one model for railroad crossing monitoring in real-time on the edge device.

2.1 Outcome #1

This study presents a portable railroad crossing monitoring system based on artificial intelligence and image processing technology. The model can simultaneously perform detection, segmentation, classification, and tracking, ensuring comprehensive monitoring of non-compliant objects and unauthorized activities within railroad areas. Real-time testing has demonstrated the model's effectiveness, confirming its suitability for deployment on edge computing devices.

3 Impacts

The field testing conducted at various railroad crossing areas highlights the robust performance of the proposed model in different environments. This model is particularly adept at identifying any unauthorized or unexpected objects within the railroad crossing area.

3.1 Impact #1

The effectiveness of proposed model in detecting anomalies and ensuring safety at railroad crossings is evident from its ability to accurately identify and segment objects that are not typically part of the railroad environment. This enhancement in detection capability is a significant step forward to the application of artificial intelligence in public safety and infrastructure monitoring.