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RESEARCH AND APPLICATION OF FOREIGN BODY MONITORING ALGORITHM FOR TRANSMISSION LINES BASED ON IMPROVED YOLOV8

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The research I plan to carry out aims to improve the accuracy and efficiency of foreign object monitoring on transmission lines through deep learning technology, especially the improvement of target detection algorithms.

First, considering the data diversity and complexity faced by power line foreign object detection in practical applications, I plan to use data augmentation technology to expand the training dataset. By simulating various weather conditions, light changes, and foreign object types, we can effectively improve the generalization ability and robustness of the model while increasing the cost of data collection. Secondly, I will focus on improving the current advanced algorithm in the field of object detection, YOLOv8. Through guided analysis and adjustments to the YOLOv8 architecture, such as improving its feature extraction network, optimizing facility settings, and introducing attention mechanisms, we expect to significantly improve detection speed and accuracy. This is of great significance for real-time monitoring of foreign objects on transmission lines, such as brackets, bird nests and other potential risks. Finally, based on the above research results, I plan to design a set of output circuit foreign body detection software. The software includes not only a front-end interactive user interface that allows operators to easily configure and start inspection tasks, but also internal data processing and model reasoning modules. Our goal is to develop a system that is easy to use and can complete foreign body detection tasks efficiently and accurately.

The success of the entire project is of great significance to improving the reliability of safe operation of the power grid and reducing the risk of accidents caused by foreign objects.

References

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DEVELOPMENT OF THE VEHICLE PARKING MANAGEMENT SYSTEM

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The project is a client-server web-application based on Spring Boot framework [1] and MySQL database [2]. Application is a parking lot management system that utilizes API interfaces for data interaction with external systems and 5G IoT modules for communication, in order to achieve efficient and real-time parking lot management. The system integrates computer network, image recognition and processing, as well as automatic control technology to automate vehicle management in the parking lot, including vehicle access control, automatic license plate recognition, parking space retrieval, guidance, image display, time calculation, fee collection and verification.