

**Title :** Web-Based Pipeline Integrity Assessment System Using Image Processing and AI

Classification of Rust Severity

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**Type of presentation\*** (choose 1) :  Oral Presentation

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Cooperative Education

## ABSTRACT

Dexon Technology Public Company Limited requires a web-based application to receive images from users and display pipeline defect analysis results. This project, “Web-Based Pipeline Integrity Assessment System Using Image Processing and AI Classification of Rust Severity”, was conducted under a cooperative education program. The developed system addresses issues of fragmented data and enhances the convenience of monitoring results by allowing users to upload inspection images, view prediction outcomes, and access summarized information through a single page. The workflow involves (1) preparing and organizing inspection image data (2) training and evaluating a defect detection model using RF-DETR to generate bounding boxes and classify rust severity levels (Slight, Moderate, Severe, Extreme) and (3) integrating the model through an API with a visualization web-based application interface developed using Vue.js, while Python was employed for model training and API services. The result is a prototype web application that accepts user-uploaded images, connects to the AI model API for rust severity classification, and displays bounding boxes, classes, and confidence scores, reducing data consolidation efforts and enhancing transparency in the inspection process.

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