Method for Estimating Causes of AI Decision-making Errors in Train Forward Surveillance

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In the railway industry, there is a growing trend of using AI and camera images to automate various tasks that were previously performed visually. However, when considering the future application of AI in safety-critical operations such as autonomous driving, it is essential to investigate the causes of AI decision-making errors. Therefore, we have developed a tracing method for train-forward surveillance systems that estimates the causes of AI decision-making errors, such as missed detections, at three stages: input images, AI structure, and training data. This paper reports the developed method for estimating the causes of AI decision-making errors and its verification results.