# A Study of AI-based Harbor Surveillance System

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## Abstract

When ships of various types and sizes enter and depart from ports, the risk of collision between ships is high. In particular, collisions between large ships can lead to major accidents. In order to avoid crashes, it is important to quickly identify hazardous situations in advance using harbor surveillance system. But, the harbor surveillance system has limitations in that it continuously requires manpower and the criteria for judgment are different for each person. To solve this problem, we propose an AI based harbor surveillance system including image-based object recognition and abnormal situation recognition. Its superiority was proven through simulation. In the object recognition, YOLOv5, which had the best performance with an mAP of 0.953, was used. The abnormal situation was determined through the distance between the recognized objects, and the comparison of the determination results for 21.5 seconds (66 samples) showed 100%.

## Index Terms

Harbor surveillance, Artificial intelligent, Object detection, Anomaly situation determination

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