

Title Abstract: Camera-based location detection of non-AIS vessels

Topic: Navigation safety in a digital world

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Abstract:

This presentation introduces camera-based location detection technology using artificial intelligence (AI). The maritime accidents involving non-AIS vessels account for about 80% of the total of maritime accidents in Japan. In order to decrease non-AIS vessels' accidents, Japan Coast Guard (JCG) is developing location detection technologies that do not rely on AIS signals. Recent progress of AI technologies has made it possible to automatically find and extract vessel(s) from pictures. In addition, recent computers have enabled to apply these technologies on a real-time basis. With this background, JCG, by extensive research, is focusing on the development of ship location detection by means of camera, which combines location detection with 3D-2D mapping by geometrical transformation.

The JCG has conducted a performance evaluation of the technology in February 2019. Its result shows that the technology could detect more than 85% of vessels in the video images. In addition, it was also found that the technology could estimate the vessels' positions with less than 50m of margin of error. Furthermore, the whole process of the technology was performed in real-time. Those results indicate the potential of the technology as a future substitute of AIS.