Outlook for Navigation - Comparing Human Performance with a Robotic Solution

Considering whether a temporarily unattended bridge could be allowed, Maritime Authorities wish to investigate whether sensor technology is available that, when seconded by sophisticated computer algorithms, is able to provide outlook with the same reliability and safety as that of the average human outlook. This paper reports findings from a comparative study of human versus electronic outlook. Assessment of navigator's outlook is based on measurements with a wearable eye-tracker and areas of their visual attention are recorded on video. Simultaneously, a set of electro-optical sensors provides image-data as input to computer algorithms that detect and classify objects at sea within visual range. The paper presents the methodology used to deduct, from the observations of fixations, when the navigator turned his attention to a particular object and compares this with the Electronic Outlook. On the technology side, the paper details on how machine learning is used for object detection and classification, and discusses quality attributes, including efficiency and robustness of detection and classification, expressed through statistical measures.

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