

## Fuzzy Inference System for Determining Collision Risk of Ship in Madura Strait Using Automatic Identification System

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**Abstract :** Madura Strait is considered as one of the busiest shipping channels in Indonesia. High vessel traffic density in Madura Strait gives serious threat due to navigational safety in this area, i.e. ship collision. This study is necessary as an attempt to enhance the safety of marine traffic. Fuzzy inference system (FIS) is proposed to calculate risk collision of ships. Collision risk is evaluated based on ship domain, Distance to Closest Point of Approach (DCPA), and Time to Closest Point of Approach (TCPA). Data were collected by utilizing Automatic Identification System (AIS). This study considers several ships' domain models to give the characteristic of marine traffic in the waterways. Each encounter in the ship domain is analyzed to obtain the level of collision risk. Risk level of ships, as the result in this study, can be used as guidance to avoid the accident, providing brief description about safety traffic in Madura Strait and improving the navigational safety in the area.

**Keywords :** automatic identification system, collision risk, DCPA, fuzzy inference system, TCPA

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