INTELLIGENT MARITIME TRAFFIC PREDICTION & COORDINATION

Technology Overview

As one of the busiest ports in the world, Singapore is working towards being the world-leading smart port through continuous development of knowledge-based port services and maritime-related expertise. Considering the volatile changes and complexity of sea traffic and port operation activities, there is a need to develop innovative solutions for better optimisation of complex port and vessel traffic systems, which eventually enhance safety and efficiency of maritime operations.

Our solution will facilitate risk analytics, hotspot prediction, and intelligent coordination of vessels to mitigate hotspots. Through better management of maritime traffic, ships will experience reduced congestion and safer navigation through a congested waterway and port.

Features & Specifications

Sea traffic is expected to grow with increasing level of trade and e-Commerce activities. At the same time, larger and faster vessels will be sailing through increasingly congested waterways and ports. Consequently, safety will become an increasingly important issue. For a port to maintain its competitiveness, it must provide ships with the assurance of safety in sailing through its waters.

Our solution makes use of multi-agent technology, reinforcement learning, intelligent scheduling, and pathfinding to derive time schedules and routes of vessels, so as to avoid getting into situations of congestion and hot spots. Unlike air and land traffic that is regulated by strict traffic rules, sea traffic is not as regulated and usually left to the decisions of captains. Hence, the problem is complex in that it involves decision making by multiple vessels together with the maritime authority.

Potential Applications

Our technology can be integrated into next generation e-Navigation systems used by maritime authorities worldwide. This is to predict and mitigate hotspots, achieving smooth and safe navigation in the sea and reduce seaside congestion.

It is a decision support tool using simulation models that identify hotspots, enables real-time coordination and provides automated guidance to pilots and captains to improve the efficiency and safety of navigation.

Customer Benefits

Our technology enables maritime and port authorities to evaluate the impact of traffic growth and changes to port operation efficiency in traffic flow and safety. An effective management of maritime traffic will reduce traffic congestion and risk of incidents, and enhance the competitive edge of a port in a large city.

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