



## JellyGo: Bridging Science and Application through an In-situ-Based Jellyfish Abundance Prediction Model

Fluctuations in jellyfish population is a common occurrence along the coastal area of Penang Island. The dynamic nature of jellyfish abundance, coupled with inadequate stings management have posed a significant challenge in local ecosystems and beach safety. This study presents a transition from scientific research to practical application with the development of the JellyGo app, addressing the escalating threat of jellyfish blooms in Malaysian waters, particularly around Penang Island. The innovative mobile application has integrated three main features: (1) Monthly Jellyfish Abundance Prediction, (2) Emergency Action Plan and (3) Citizen Science. Two years of In-situ research data (2021-2022) comprising jellyfish abundance and environmental parameters were collected from 10 sampling locations covering the northern and western costs of Penang Island. A vector autoregression analysis was employed to forecast site-specific monthly jellyfish abundance in unit of individuals per cubic meter. The React Native and Next JS framework was used to develop an immediate distress alert for medical attention. A supervised learning approach was used to incorporate scar detection and identification feature in app with reference to published jellyfish data. Besides, a citizen science platform was implemented in the application to compliment data collection through proposed sampling programs. As a result, the abundance prediction model has demonstrated precision with a standard deviation of 1.45 individuals per cubic meter, offering valuable insights into jellyfish abundance patterns for advanced preparation and risk mitigation. Finally, JellyGo wishes to bridge science and practical application with the aims to support multiple Sustainable Development Goals (SDGs) by addressing the scarcity of jellyfish data and to steer environmental stewardship and public safety in Malaysia.

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