# The design of Machine Learning for searching casualty people in the Gulf of Thailand

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**Abstract.** This research designs a machine learning model for the Royal Thai Navy (RTN) in searching casualty locations and the time of the following suffering incident occurring in the Gulf of Thailand. From collecting information on the RTN's search and rescue (SAR) operations in 2019 - 2022, there were 146 incidents, and several casualties did not survive. It was found that the delays in assisting were the main reason for the loss. Therefore, the machine learning predictions can support the RTN's SAR operations. The Long-short Term Memory (LSTM) is used to create the machine learning predicting model, and the outputs are in terms of the Latitude, the Longitude, and the days after the previous incident, while the root means square error (RMSE) is used to test the validity of the predicting model. The result shows that the RMSE of testing data of the Latitude, Longitude, and the days after the previous incident prediction are 0.906 degree-North, 0.507 degree-East, and 5.633 days, respectively. In practice, the following suffering incident is predicted: on the Latitude 12.017 degrees-North, the Longitude 101.786 degrees-East and happening in the next 41 days after the previous incident, which is far from the actual incident, approximately 11.5 nautical miles, and the incident occurred after the predicted value of 14 days. Using machine learning allows the RTN SAR teams to prepare for disaster relief in advance. For this reason, the Royal Thai Navy SAR operations can increase the chances of meeting those in need and increasing the chances of survival.

**Keywords.** Machine Learning, AI, Long-short Term Memory, Search and rescue operations, The Royal Thai Navy

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