Background: Most of the goods are transported around the world by shipping which relies heavily on fossil fuels for powering.

Given the expenditure of the shipping industry on the fuel, a main objective of a shipping company is to optimize the ship route for the least fuel consumption.

Depending on the type and purpose of the voyage, it is also desirable to optimize several other parameters such as, the travel time, passenger comfort and route safety, to avoid any damage to the ship, cargo, crew and passengers.

Optimization of each of these parameters serves a purpose. For instance, an energy efficient route may not be safe in terms of weather.

Therefore, to avoid loss of life and property, route weather safety needs to be considered. An application suggesting the optimal route based on the chosen set of optimal parameters for any voyage between two ports in the Indian Ocean, will immensely benefit the Indian shipping industry.

Description: At the heart of any optimal ship routing application lies the optimization algorithm. Although scientific literature is available on various methods of optimizing the ship routes, given the commercial potential, there are no applications available publicly which can be customized for the Indian Ocean region.

The optimization methods reported in literature range in complexity, computation time, versatility, etc. Various factors, such as, the forcings (surface winds, currents and waves), design of the ship and ship drift characteristics, impact the ship’s motion at sea.

The optimal route must be continually evolving because the weather conditions keep changing as a ship proceeds on its voyage.

Therefore, it is crucial to choose a suitable optimization method that can optimize several parameters for a range of ships (with varying type, dimensions, drift characteristics of a ship) and develop an algorithm to return an optimal route within a reasonable computational time.

The algorithm can optimize for the voyage time and safety to begin with but with a scope for addition of more optimization parameters.

1. Objectives:

Sustainable & Green Tech : Fossil fuel consumption

Zero Carbon Emission

Least Fuel

Travel Time

Passenger/ Crew Comfort and safety

No vessel damage

Weather Safety, Evolving i.e. updated

Easy Access Publicly

Proposed Solution:

Algorithm with less time complexity to function

A webapp

1. Technology stack

Languages, frameworks, libraries etc

Stake holder: Ministry of Earth Sciences, INCOIS, ESSO, Ministry of transport,

Use case diagram

1. Feasibilty

Product status

USP:

Time complexity

Sustainability

Carbon emission 0

Manual Calculation

Map color reader

Ease of access

Challenges

Solutions to it

1. Impact

Business model

Show stoppers

Market value

Additional Features

1. Research papers

Idea Title:

SRO (Ship Route Optimizer): A Deep Learning Model which provides versatile & optimal ship route

Idea Description:

A Deep Learning Model Which When provided with the coordinates of source and destination gives an optimal ship route coordinate.

This model decides the optimal route in consideration to the weather, safety of the passengers and crew fuel required to reach the destination and the cost required for the vessel to travel from the store to the destination.

Abstract:

• We have developed a Deep Learning Model which has less Time Complexity

• This Model takes real time data through API for weather

• The Web-app consumes a very less space complexity of only 2 GB.

• It’s a fast-running DL model with ease access to people with zero knowledge of Machine Learning

• It shows the optimal route depending on the type of cargo too

• Depending on the type of cargo, vessel type and distance it displays the fuel requirement

• It displays the coordinates of the route to be followed in case of navigation compass failure

ADDITIONAL FEATURES

• An external feature is added in case of no network a simple Map

color reader is embedded in the algorithm, which will give the

result just by reading colors of them MAP

• As its difficult to check software internal calculations manually we

have an embedded feature which shows the Results of the

Internal Algorithmic Calculation.

• AI Assistance, we have added a ChatBot for navigating through

the webapp

• Identifies Ship Traffic in nearby regions