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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**GE19612 – PROFESSIONAL READINESS FOR INNOVATION,
EMPLOYABILITY AND ENTREPRENEURSHIP**

SailSafe: Developing an Integrated Safety and Monitoring Solution for Deep-Sea Fishermen using GPS Technology

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Abstract

"SailSafe" is an ambitious project dedicated to improving the safety of deep-sea fishermen through an integrated solution that leverages advanced GPS technology for real-time tracking and monitoring. This system is designed with user-friendly interfaces and proactive alert systems to notify fishermen of potential hazards such as adverse weather conditions and nearby vessels. By enabling fishermen to make informed decisions and navigate safely, "SailSafe" addresses the inherent risks of operating in remote and challenging maritime environments. Additionally, the system allows authorities to monitor fishing activities closely and respond promptly to emergencies, thereby enhancing overall safety measures. The project's focus on collaboration with stakeholders and continuous refinement underscores its commitment to making a meaningful impact on maritime safety. By reducing risks and improving the well-being of fishermen, "SailSafe" aims to revolutionize safety practices in the industry and ensure the long-term sustainability of deep-sea fishing operations.

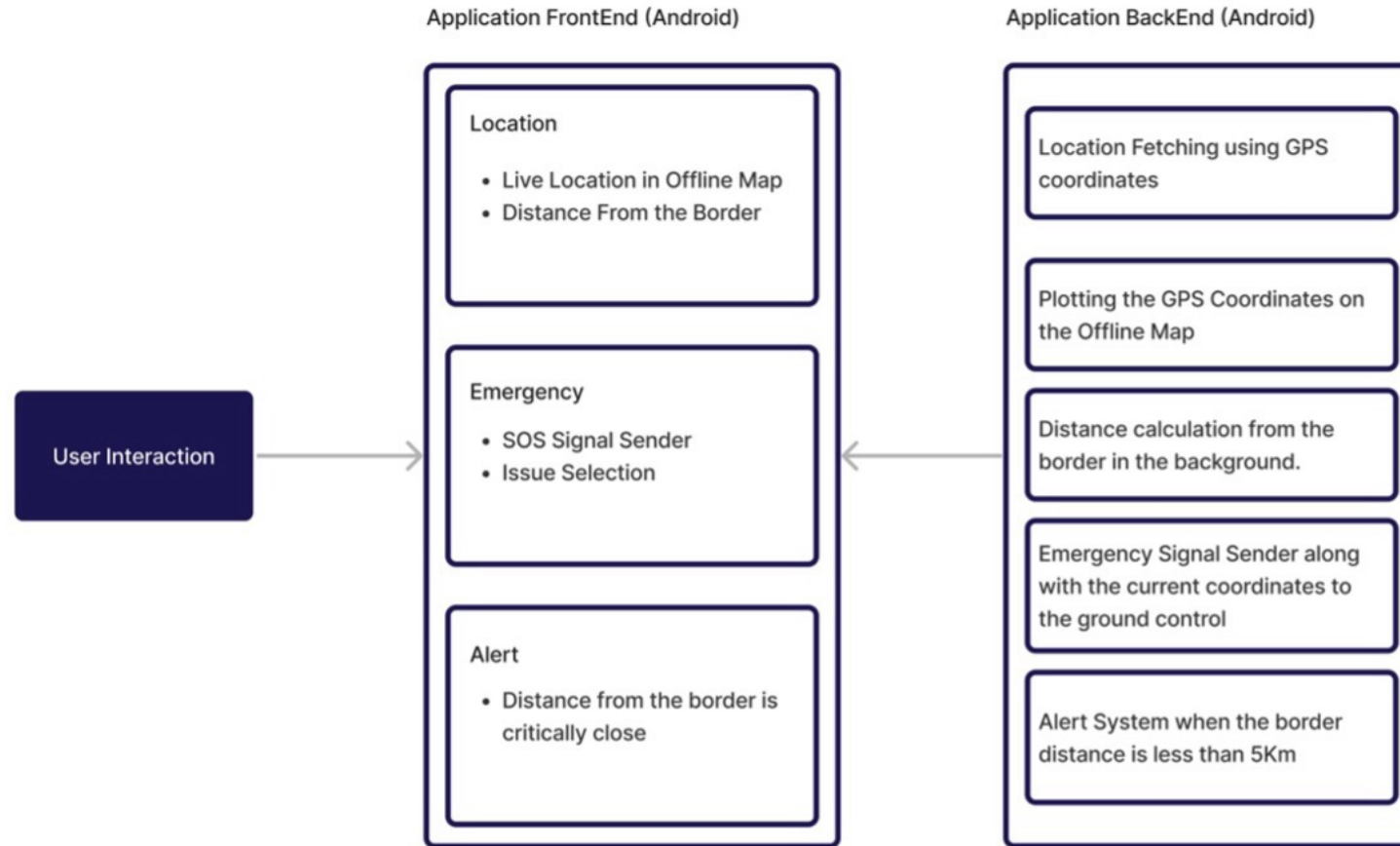
Existing System

Currently, deep sea fishermen rely on a mix of traditional and modern methods to ensure safety and compliance with maritime boundaries. Traditional methods include nautical charts and compasses, which require manual interpretation and are prone to human error. Some fishermen use GPS devices for location tracking, but these devices often lack integrated alert systems for border violations. Marine VHF radios are commonly used for communication, including emergency distress signals, but they depend on range and manual operation. Additionally, some fishermen use satellite phones, which are expensive and not affordable for everyone. While there are maritime tracking systems available, they often require continuous internet connectivity, which is unreliable or unavailable in deep sea conditions. Overall, existing solutions are fragmented and not specifically designed to address the unique challenges faced by deep sea fishermen, particularly the need for offline functionality, real-time border alerts, and a streamlined emergency SOS signal system.

Proposed System

Sailsafe is an innovative mobile application designed specifically for deep sea fishermen to enhance their safety and operational efficiency. The app provides real-time border violation alerts by calculating the distance between the vessel and maritime boundaries, ensuring fishermen stay within legal waters. It features precise location tracking of the fishermen, allowing them to navigate more effectively and avoid hazardous areas. In emergencies, Sailsafe offers an offline SOS signal function, enabling users to send distress signals even without internet connectivity. The SOS feature uses pre-stored emergency contacts and broadcast mechanisms to alert nearby vessels and authorities. The user-friendly interface of Sailsafe ensures ease of use, even under challenging sea conditions. By integrating these critical safety features into one accessible platform, Sailsafe addresses the limitations of existing fragmented solutions, offering a comprehensive and reliable tool tailored to the needs of deep sea fishermen.

System Architecture



List Of Modules

- Location Tracking
- Offline SOS Signal
- Border Violation Alert
- User Interface

Functional Description for Each Module

Location Tracking Module:

- **Functionality:** This module tracks the precise location of the user's vessel using GPS technology.
- **Features:**
 - Continuously monitors and updates the vessel's coordinates.
 - Displays the vessel's real-time location on a map interface within the app.
 - Provides information on speed, direction, and other relevant parameters.
 - Allows users to set waypoints or destinations for navigation purposes.
- **Benefits:**
 - Enables fishermen to accurately track their position and navigate to desired locations.
 - Facilitates safer navigation by helping users avoid hazards and stay on course.

Offline SOS Signal Module:

- **Functionality:** This module enables users to send distress signals even without internet connectivity.
- **Features:**
 - Allows users to trigger an SOS signal directly from the app interface.
 - Utilizes satellite communication or other offline methods to broadcast distress signals.
 - Sends the user's location coordinates along with the distress signal to aid in rescue efforts.
 - Notifies nearby vessels and maritime authorities about the emergency situation.
- **Benefits:**
 - Provides a critical lifeline for fishermen in emergency situations, regardless of internet availability.
 - Enhances the chances of timely rescue and assistance during distress scenarios.

Border Violation Alert Module:

- **Functionality:** This module detects and alerts users when their vessel approaches or violates maritime boundaries.
- **Features:**
 - Calculates the distance between the user's vessel and predefined maritime borders in real-time.
 - Issues visual and audible alerts when the vessel enters a predefined boundary zone.
 - Provides warnings and notifications to help users navigate back into legal waters.
 - Offers customizable alert settings, such as threshold distances and alert preferences.
- **Benefits:**
 - Helps fishermen comply with maritime regulations and avoid unintentional border violations.
 - Enhances situational awareness by alerting users to potential legal and safety risks.

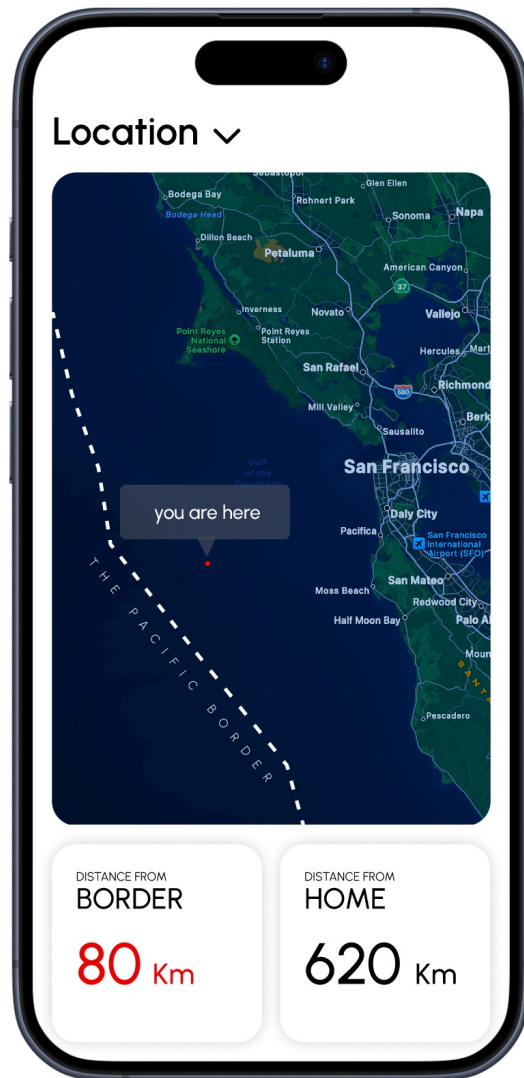
User Interface Module:

- **Functionality:** This module provides a user-friendly interface for interacting with the Sailsafe app.
- **Features:**
 - Presents a visually intuitive layout with easy-to-understand navigation elements.
 - Offers clear and concise displays of critical information, such as location data and alerts.
 - Supports interactive features for setting preferences, initiating actions, and accessing help resources.
 - Adapts to different screen sizes and device orientations for optimal usability.
- **Benefits:**
 - Enhances user engagement and satisfaction by providing a seamless and intuitive experience.
 - Facilitates efficient interaction with the app's functionalities, even in challenging maritime conditions.

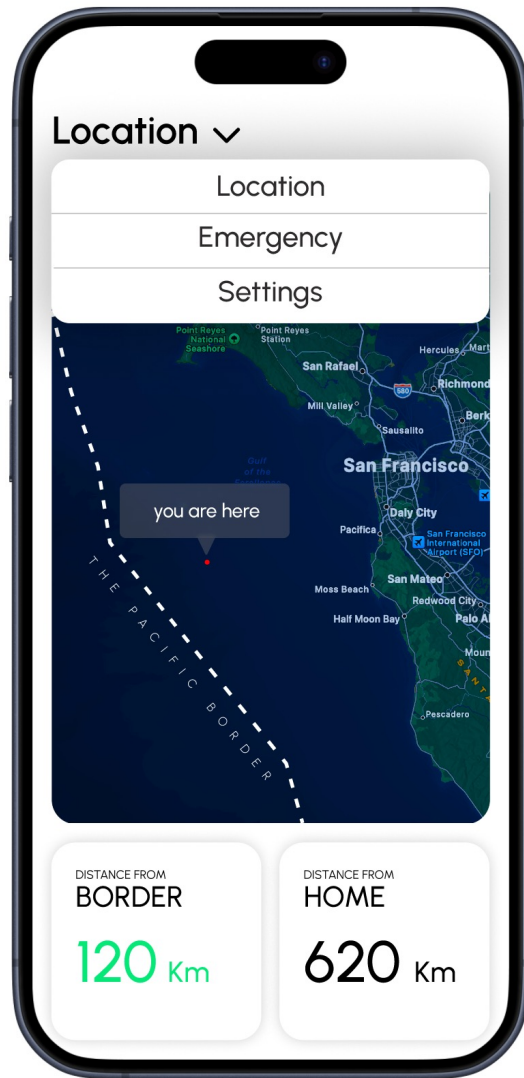
Implementation



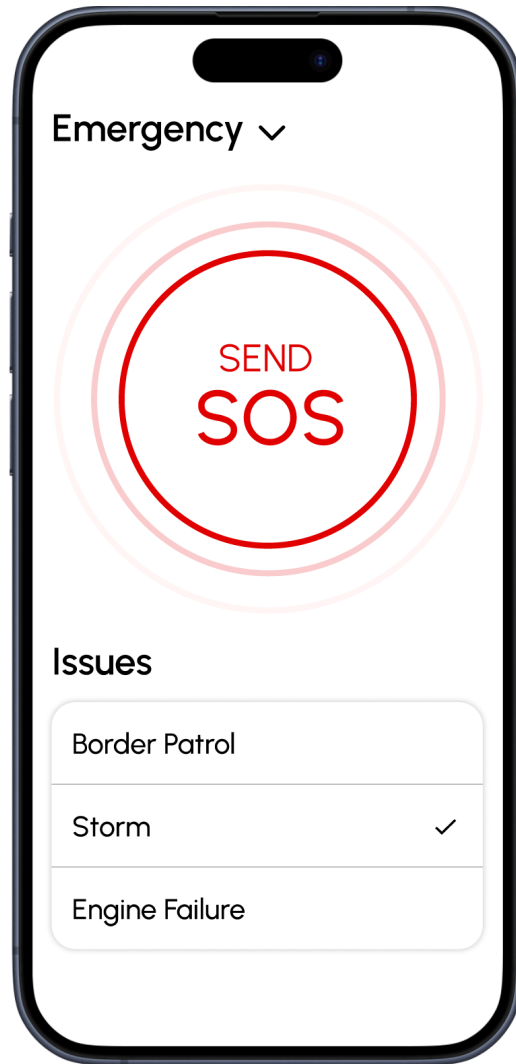
Splash Screen Page



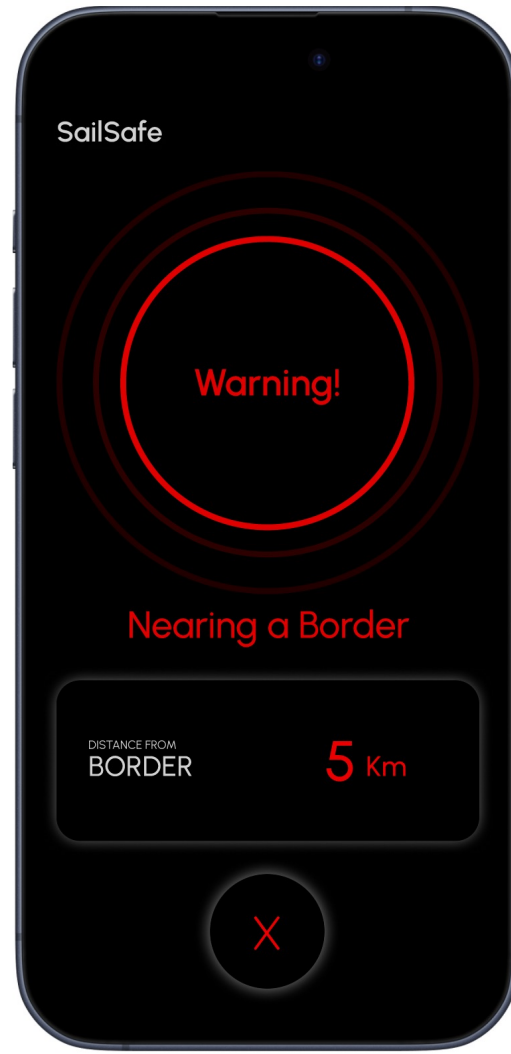
Location Page



Navigation Pane



Emergency SOS Sender Page



Border Violation Alert System

Conclusion

In conclusion, Sailsafe represents a crucial advancement in the realm of safety solutions for deep sea fishermen. By seamlessly integrating modules for location tracking, offline SOS signaling, border violation alerts, and user-friendly interface, the app addresses the unique challenges faced by fishermen operating in remote and potentially hazardous maritime environments. Sailsafe not only enhances the safety and security of fishermen but also promotes regulatory compliance and operational efficiency. With its offline functionality and real-time monitoring capabilities, the app serves as a reliable companion for fishermen, offering peace of mind and assistance during emergency situations. Moving forward, continued refinement and adoption of Sailsafe have the potential to significantly mitigate risks and improve outcomes for deep sea fishermen worldwide, ensuring their well-being and livelihoods are safeguarded on every voyage.

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