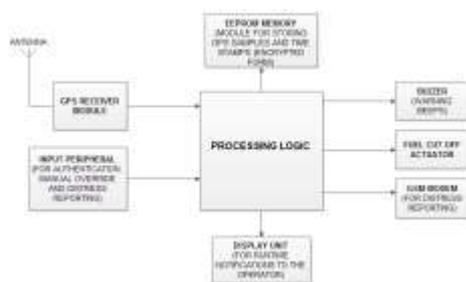


GP1012	Design and Development of a Low Cost Navigation and Security System for Indian Fishermen		
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The fishing industry plays a major role in development of Indian economy. The recent attacks on fishermen taking place in Indo-Srilanka and Indo-Pakistan maritime boundaries have been major concerns. These attacks are primarily caused by the lack of navigation and security features during the voyage. Hence the current situation demands the implementation of precise facilities for reducing man and material loss.

This project involves the design and implementation of a low cost Navigation and Security System for Indian fishermen on Arduino Nano platform. The system developed solves the above said issues by continuously tracking the location of fishing vessel and providing minimal security features. The system ensures that navigation is in safe zone within the nation's maritime boundary and also prevents crossover. This is achieved using GPS receiver which directly links to GPS satellites for current location of the vessel. The required data fields like the latitude and longitude data along with the time stamps are extracted from the GPS samples and used for comparison for determining the exact location of the vessel. This procedure will help in detection of corner cases when the vessel is nearing or about to crossover the maritime boundary, which cannot be marked physically. It is useful for triggering conditions like enabling or disabling fuel injection system, the warning beeps and display notifications to the fishermen. Manual override facility for restarting the engine in case of crossover for limited duration is provided. The security features like authentication for the genuine operator to get access to the engine panel, the support for distress message and the storage of the exact time stamps and GPS locations after encryption in case of initiation of transmitting distress message is provided as a blackbox feature. The passcode based mechanism allows for maximum of three attempts to unlock access to control panel. The GSM modem allows for transmission of distress message to the registered base station/coast guard. The encrypted GPS samples and time stamps are stored in on-chip EEPROM memory for future reference.

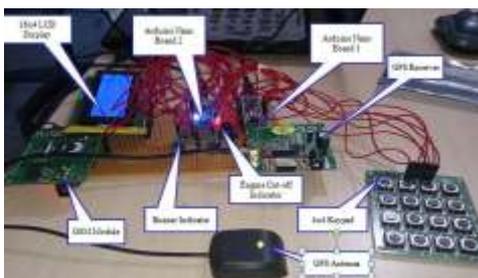
The developed Navigation and Security system is tested using the nearby Geo-points along the road. It is seen that the system is able to provide necessary triggering conditions on reaching the particular zones, detected via GPS based tracking. The security features of authentication, initiation and delivery of distress message is also verified. Additionally the Manual Override, Blackbox based encryption and storage of GPS locations were also successfully tested and verified.



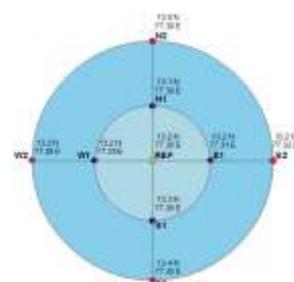
Block diagram



Electronic key



System prototype



Geo-points for system testing