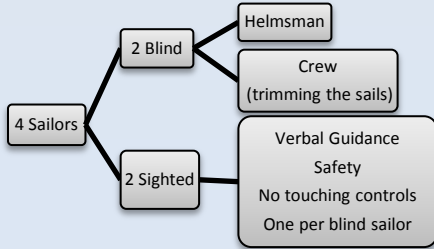


Design Background

Current ISAF rules governing Paralympic sailing:



The Project

Aim:
To be able to successfully give a visually impaired sailor navigational information so that they can sail alone. Ability to store the responses to each run for feedback that can be used during training.

Target Audience
Competitive sailing teams consisting of visually impaired sailors

Design Concept

- Ability for visually impaired athletes to independently sail
- Limited change needed in current rules
- Extendable
- Mobile
- Comfortable
- Adaptable to each athlete
- Light



The App

- Android Platform
- Functional on computer, smart phone or tablet
- Bluetooth transmission

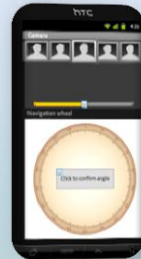


Arduino connected to an XBee

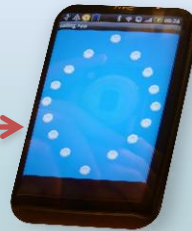
Communication

- 2x Arduino Uno
- 2x XBee's

The tablet will communicate via Bluetooth with the Bluesmif Gold Bluetooth Modem. This is connected to the Arduino Uno on the safety boat. The Arduino Uno will communicate via two XBee's, one on the safety boat and the other attached to the second Arduino Uno which will be connected to the sailor's suit.



Design of App using Prototyper



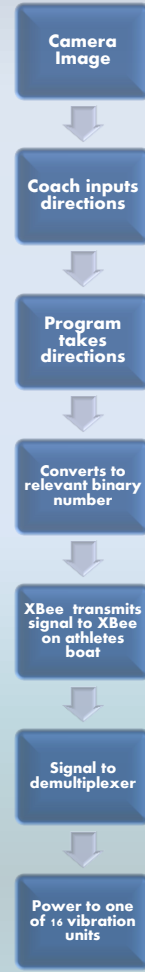
Interface of App used

User interface

- Circular ring
- 16 sectors
- Each acts as a button for coaches input
- Corresponds to the 16 directions on the vibration belt

Conclusion

Our design aims to enable visually impaired athletes to independently sail in the Paralympics. The light weight, adjustable harness controlled by a wireless app is portable and available to a vast range of sailors. Future improvements will utilise cameras, providing a 360° view providing additional visual feedback for the coach to exploit.



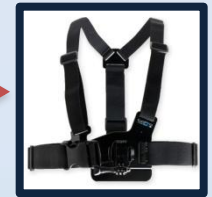
The Harness

The harness incorporates 32 vibration units placed over two rings. The upper corresponding to objectives and the lower corresponding to collision avoidance. The vibration units will be active by successive input signals sent via the app. The harness will be placed on the upper torso of the athlete, ensuring maximum mobility. With the light weight design and addition of extendable straps the harness guarantees comfort and practicality.

- 2 rings of vibration units
- Top ring for objectives
- Bottom ring for collision avoidance



Design of Harness



Harness Used

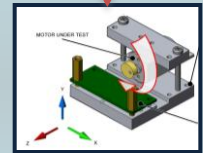
➢ Controlled by the coach on the safety boat via an app

Vibration units

- DC motor uses the power supply to drive the gear
- Small weight mounted off-centre
- When the motor spins, the gear-weight combination causes the unit to vibrate

Power Supply

- 3AA batteries powering vibration units
- Connected to back of harness



Vibration unit and motor