SONAHR: An open water navigational device
Swimming Open water Navigational Assisting GPS Headset and Receiver

Introduction
SONAHR is a stand-alone unit for open water navigation, mainly geared towards swimming. It is designed to help swimmers to stay on course in any course that the swimmer wants to swim.

Swimmers currently have to bring their head out of the water to navigate by eyesight.

SONAHR helps boost swimmer confidence and allows swimmers to keep their heads in the water during navigation.

System Overview
SONAHR will be housed completely inside the swim cap in order to minimize the impact on the swimmer. The user inputs the desired course to follow and the system keeps the swimmer on track by using vibrations on either side of the head.

Theory of Operation
1. Swimmer turns away from the vibration
2. Vibration on left side of head
3. Swimmer is off course to the left
4. When back on course, vibrations on both sides of the head

Rather than using only the bearing to assist the swimmer, SONAHR preprograms the route to allow for correction back to the desired end point, not just the desired direction.

Results
Major Course Corrections

Potential Uses
- Open water swimming
- Canoeing and kayaking
- Triathlons
  - Adapt for swimming, biking, and running
- Other water sports (jet skis, etc.)
- Military applications

The next steps
- Water resistant housing
- Mobile application for user interface
- Increase ease of route input
- Allow for more feedback
- Add more sensor monitoring:
  - Body temperature
  - Distance traveled
  - Heart rate
  - Ambient temperature
- Headphone option for voice commands
- Real-time feedback to the user

Acknowledgements
Special thanks to Estelle Rhodes, Kevin Rhodes, Don Cripps, and Jolynne Berrett.

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