

Project Summary

- Smartfin is an electronic longboard fin that collects ocean water data when submerged.
- Users attach Smartfin to their surfboard and head to the beach. Smartfin automatically collects water temperature and GPS data and transmits to the cloud.
- For environmentally conscious individuals that want to assist scientific research while having fun!

Background

Scientists typically use satellite imagery and offshore buoys to collect various ocean parameters such as water temperature. However, both methods are ineffective at collecting data near coastal regions as the seafloor is too shallow and the surf conditions are too variable. Smartfin will provide this missing data to scientists and provide a more complete dataset of the ocean.

Our project partners previously created prototypes of Smartfin. Our team was tasked to create a new prototype for Smartfin with several objectives in mind:

- Create a better method of enabling and disabling data transmission
- Increasing battery life
- Increasing reliability of data transmission
- Decreasing chance of battery expanding

Link to Project Showcase:



Smartfin

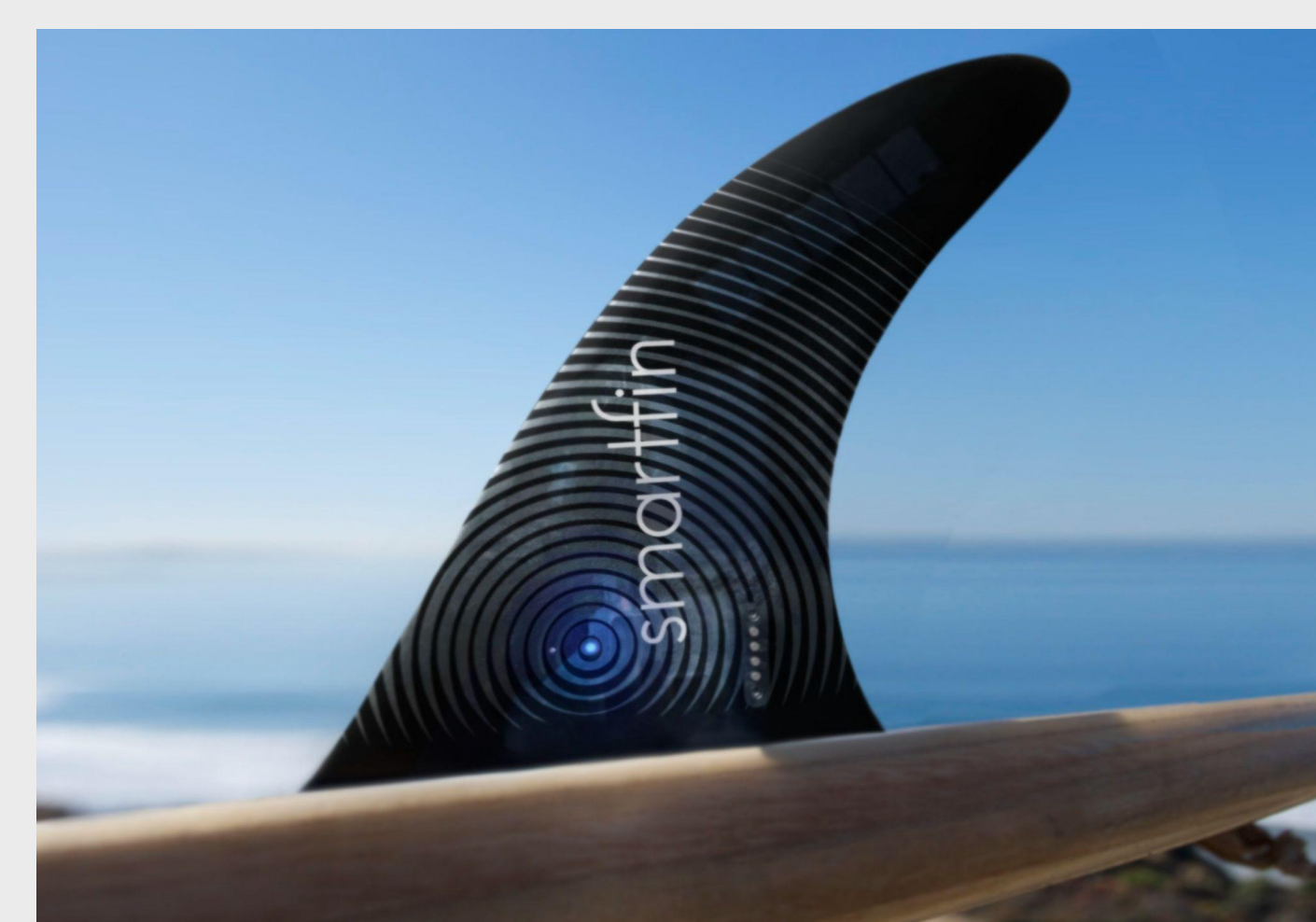
Ocean monitoring longboard fin - bridging the gap between surfers and scientists



Smartfin Applications

Smartfin was designed to help coastal environments by collecting nearshore coastal data and building a community to make large-scale change and does so by:

- Developing data-collecting technology that is well suited for dynamic and aggressive nearshore environments
- Provides near real-time ride data for duration, top speed, distance and more.
- Creates a platform for surfers to share their ride data with surfers and marine scientists



Engineering Requirements

- Battery Life: Continuously transmits data for at least six hours
- Data Transfer: Captures data from sensors and sends data continuously every ten seconds
- Location Accuracy: GPS activates within three minutes and is within thirty meters of actual location
- Physical Constraint: Fits inside the Smartfin enclosure (provided by project partners).
- Submersion Detection: Automatically activates and transmits data within fifteen seconds when submerged in water
- Temperature Accuracy: Records temperature data with a margin of error of one-tenth of a degree Celsius (when calibrated)
- Waterproof Electronics: Remains functional and can transmit data while underwater for at least three hours
- Wired Charging: Charges to at least 80 percent in eight hours

NAME	DATA	DEVICE	PUBLISHED AT
Battery	12.371094	Smartfin	5/10/23 at 5:55:13 pm
Location and speed:	44.566952, -123.275780, 01...	Smartfin	5/10/23 at 5:55:08 pm
Battery	12.371094	Smartfin	5/10/23 at 5:55:08 pm
Location and speed:	44.566952, -123.275780, 01...	Smartfin	5/10/23 at 5:55:03 pm
Battery	12.371094	Smartfin	5/10/23 at 5:55:03 pm
Location and speed:	44.566952, -123.275780, 01...	Smartfin	5/10/23 at 5:54:58 pm
Battery	12.371094	Smartfin	5/10/23 at 5:54:58 pm
Location and speed:	44.566952, -123.275780, 01...	Smartfin	5/10/23 at 5:54:53 pm
Battery	12.371094	Smartfin	5/10/23 at 5:54:53 pm
Location and speed:	44.566952, -123.275780, 01...	Smartfin	5/10/23 at 5:54:48 pm
Battery	12.371094	Smartfin	5/10/23 at 5:54:48 pm
Location and speed:	44.566952, -123.275780, 01...	Smartfin	5/10/23 at 5:54:43 pm
Battery	12.371094	Smartfin	5/10/23 at 5:54:43 pm
Location and speed:	44.566952, -123.275780, 01...	Smartfin	5/10/23 at 5:54:38 pm

Team Members

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- Treven Headley - Fuel Gauge and GPS Module headleyt@oregonstate.edu



- Paolo Rueda - Water Sensor and On/Off ruedap@oregonstate.edu



- Xuje - Voltage Regulator, Main Board, and Microcontroller xuje@oregonstate.edu

