

Smartfin is a longboard fin that aims to bridge the gap between surfers and scientists. Each Smartfin can be mounted on a longboard and collects real-time temperature, wave, and GPS data. Data is then transmitted to the cloud and available for analysis via a database.

Previous prototypes of Smartfin have varying features with some more successful than others. Smartfin is designed to collect and transmit ocean data while minimally affecting a surfboard's performance while remaining cost effective. Our team will identify the best features of the previous Smartfin prototypes, research possible improvements for the next iteration, and construct and test said prototype.

Our version of the Smartfin prototype uses a power management integrated circuit (PMIC) as our method of having a wired charging connection along with a fuel gauge to monitor the system's battery life. This will provide a basis for future iterations to implement a feature in a user interface for customers to see as they use their fin out on the ocean. Furthermore, it resolves one of the more important issues the Smartfin team had with their previous charging circuit applications.

The developmental process of the project started with each member of the team focusing on two specific blocks that make up the main system. When each of the blocks were completed, the team came together to create the final system. Due to lack of knowledge of each other's blocks, the implementation of the final system was tricky. The final system should have included the water sensor and temperature sensor; however due to some issues, implementation on their own worked effectively, but not as part of the main system. One main revision to the design would be to make the enclosure of the fin in an actual fin shape so that it can be placed on a surfboard and actually tested in the ocean. The focus originally was all about being able to test our final system on the Oregon Coast, however our project goals shifted throughout the term and were more focused on completing the requirements.

Various key lessons from this project include:

- Learn how to write successful documentation that exhibits a clear overview and understanding of the project
- Setting realistic, timely, effective goals, especially for engineering requirements
- Technical skills in schematic and PCB design; programming
- Productive weekly meetings with the team to discuss progress as well as potential issues

Project Timeline:

TASK ID		1	2	3	4	6	7	8	9
TASK TITLE		Design Phase	Bill of Materials	Block diagram	PCB design	Research Phase	Building Phase	Testing	Presenting
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