

Dog Fitness Tracker

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Design Problem Statement

- Chip, our client, is trying to track the activity of abused dogs to ensure proper rehabilitation.
- He tasked us with building an inexpensive and resettable device to track dog activity. The tracker is used for a month-long period aiding in the rehabilitation of the dogs.
- The device uses an accelerometer which monitors the dog's activity, storing distance travelled in a memory log, and presents it in a remote interface to the owner.

Who are we helping?



Fig. 1 - Saving Grace Dog Shelter

Prototyping Stage

The prototyping stage was divided into two separate components: the physical device and the electronics.

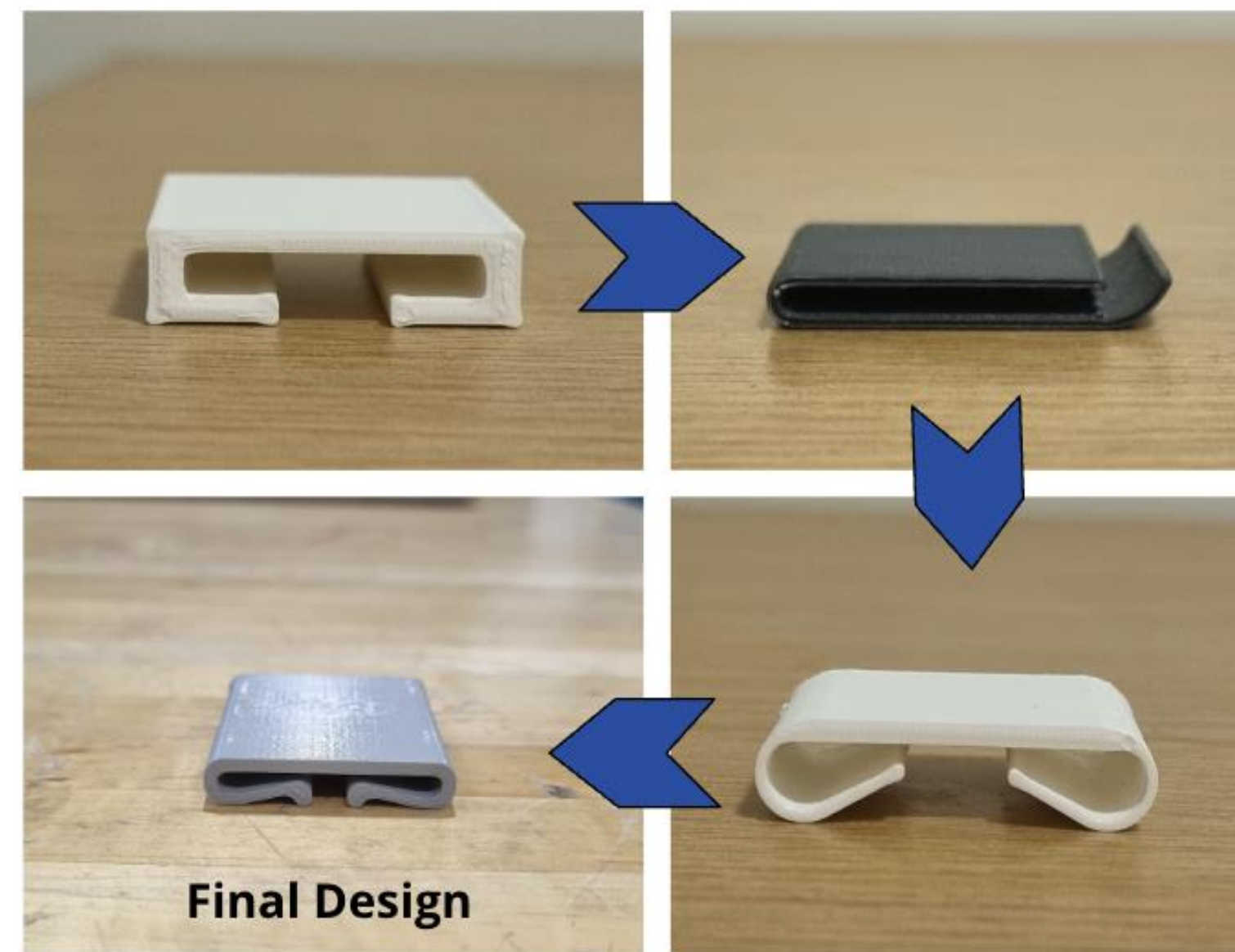


Fig. 2 - Prototype Clips And Final Design

Final Design

Dog "Fitbit": A device that attaches to the collar of a dog to keep track of **distance travelled** throughout the day via wireless connection.

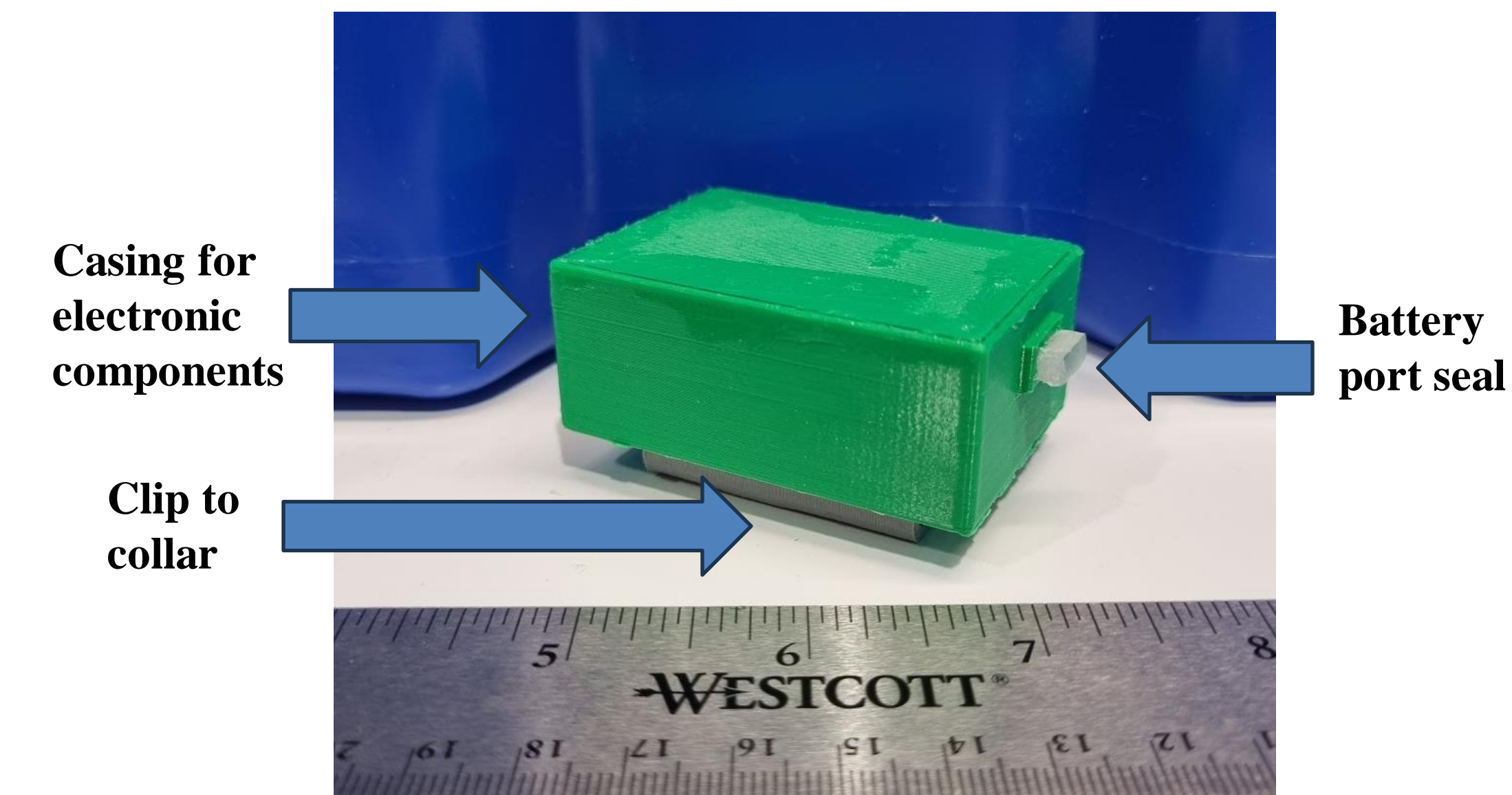


Fig. 4 - Final Design

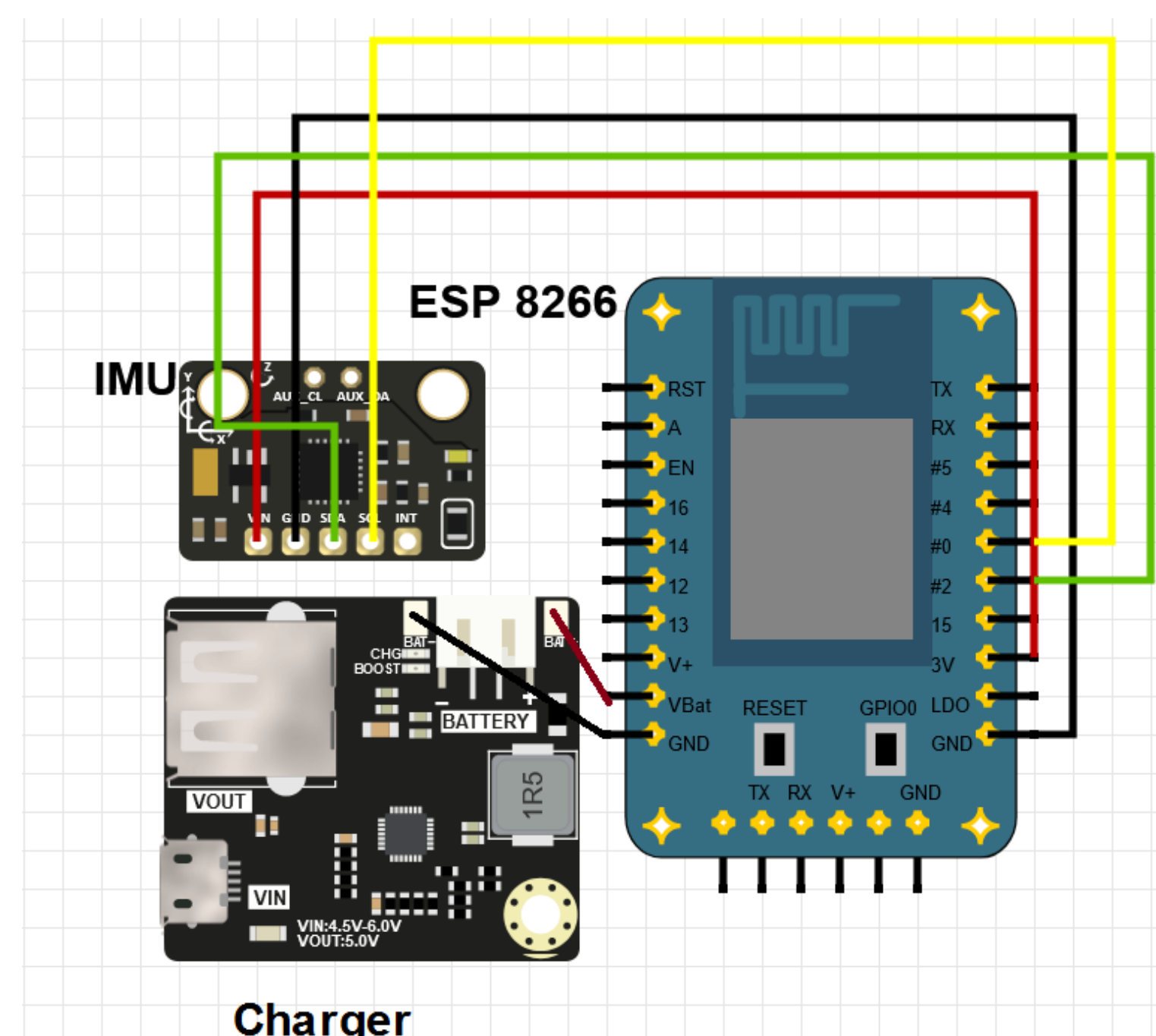


Fig. 3 - Electronics Diagram



Fig. 5 - Prof. Becky's Dog In Testing

Design Criteria and Testing

Design Criteria	Target Value	Testing Method	Results
Safety (Constraint)	Follows American Kennel Club Regulations	Research regulations relevant to the components of the device	Pass - The device follows all regulations.
Durability (Constraint)	1. Lasts > 1 year 2. Waterproof up to 1m	1. See if the device has any damages after being used for 20 minutes on an active dog 2. Place the device under water to see if any water leaks into the device	1. Pass - Device showed no damages while on the dog 2. Pass - Device was waterproof
Cost (Objective)	< \$50 per device	Add up the costs of the components of the prototype	Pass - Device costs \$17.54
Size (Constraint)	Weighs <3 ounces	Weigh the device and put it on the dog to see if the dog is comfortable with the device	Pass - Device weighs 2.3 ounces and is comfortable on the dog
Data Accuracy (Objective)	Less than 15% error on the data	Compare the measurements of our device with the measurements of a smart watch	Failed - Device collects data with 75% accuracy
Battery Life (Objective)	Lasts > 2 days	We will attach the working collar to the dog on a Saturday hike and will simultaneously be collecting data and measuring the battery life.	Failed - The battery we have is not meant to last longer than 2 days as the ESP8266 drew much more power than anticipated

Conclusion and Future Plans

- We were able to create an activity tracker which adhered to our design criteria.
- Our tracker is mounted on a dog's collar
- Our product can be easily set up and used by an inexperienced individual
- In the future, we would like to convert our data into calories, steps etc. In order to provide a personalized activity report to the owner
- We are currently and will continue to test our design with our client and the shelter

Acknowledgements

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