



# OpenWheel: A One-Wheel Skateboard for All

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## Background

The OpenWheel is our open-source answer to the popular OneWheel electric skateboard. We're starting from a prototype built over the summer. We aim to turn this prototype into a finished product.

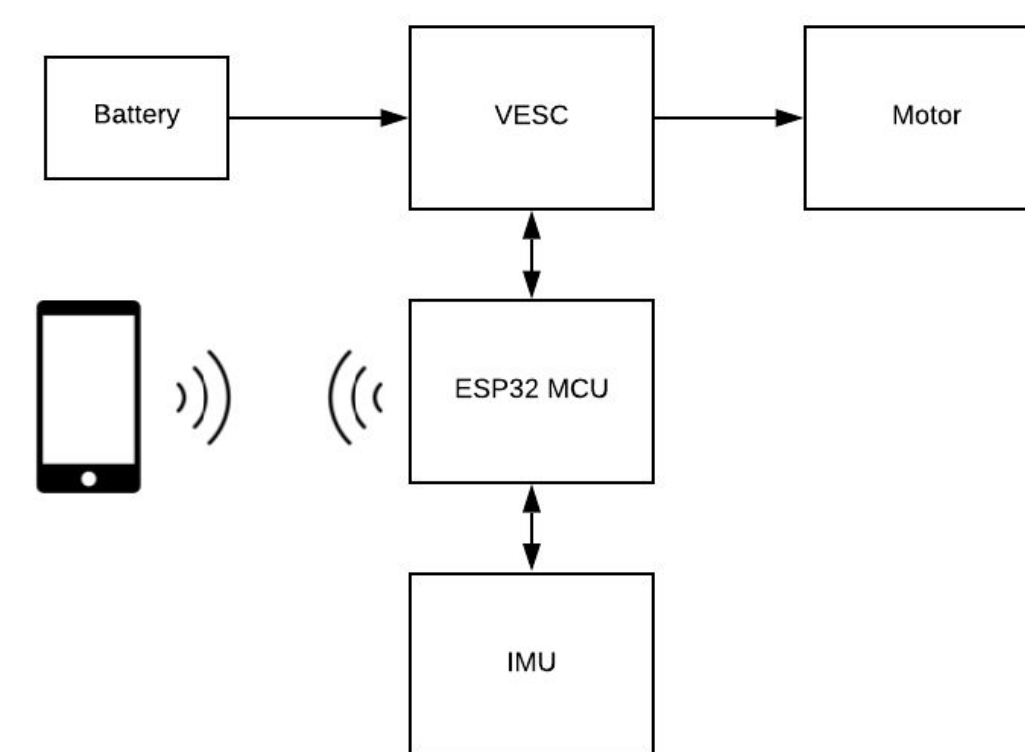
## Project Goal

The OpenWheel aims to be a durable and portable mode of transportation for the everyday commuter. This addresses a solution to the last mile, in which commuters navigate from a transportation hub to the final destination (home or office).

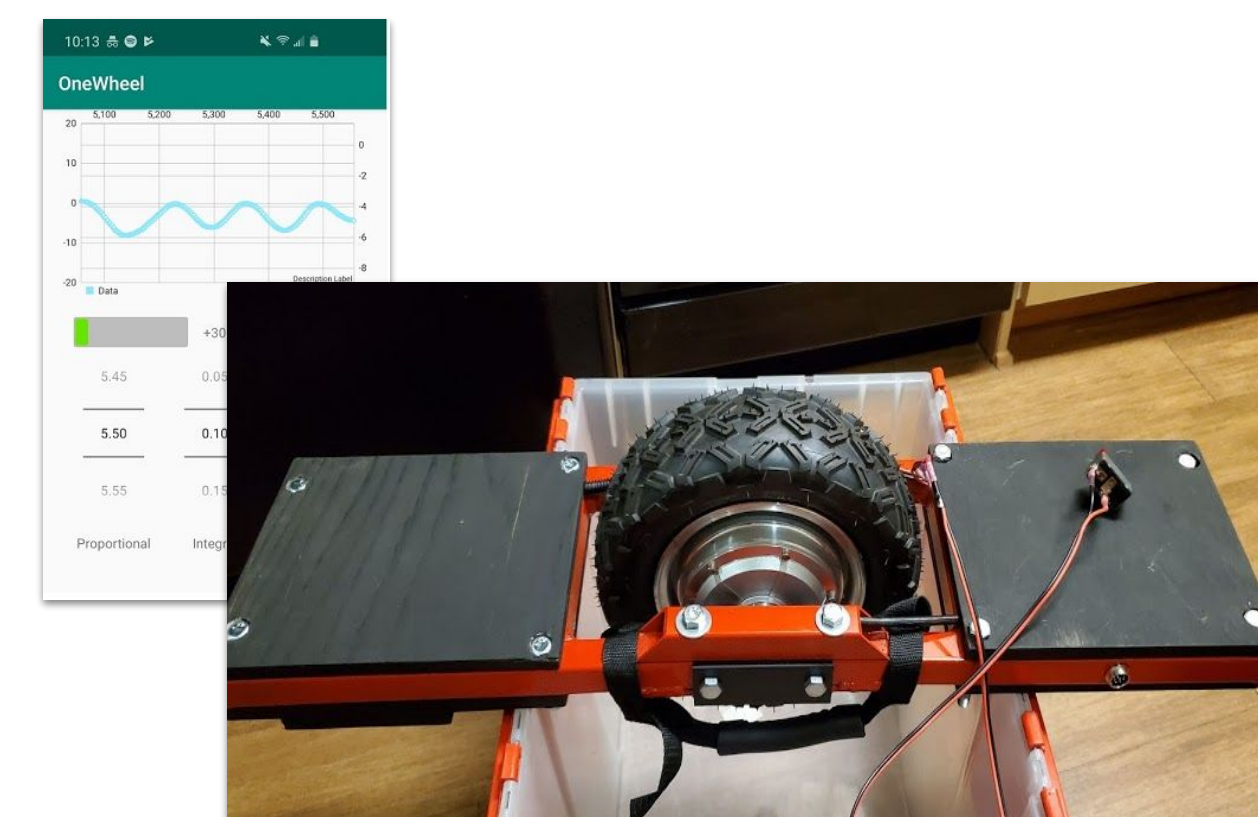
## Implementation

The heart of the system is an ESP32 microcontroller, which runs a PID loop to balance the rider. It hosts a BLE server which allows communication to the mobile app. The frame was built using aluminum rails and 3d-printed footpads and bumpers.

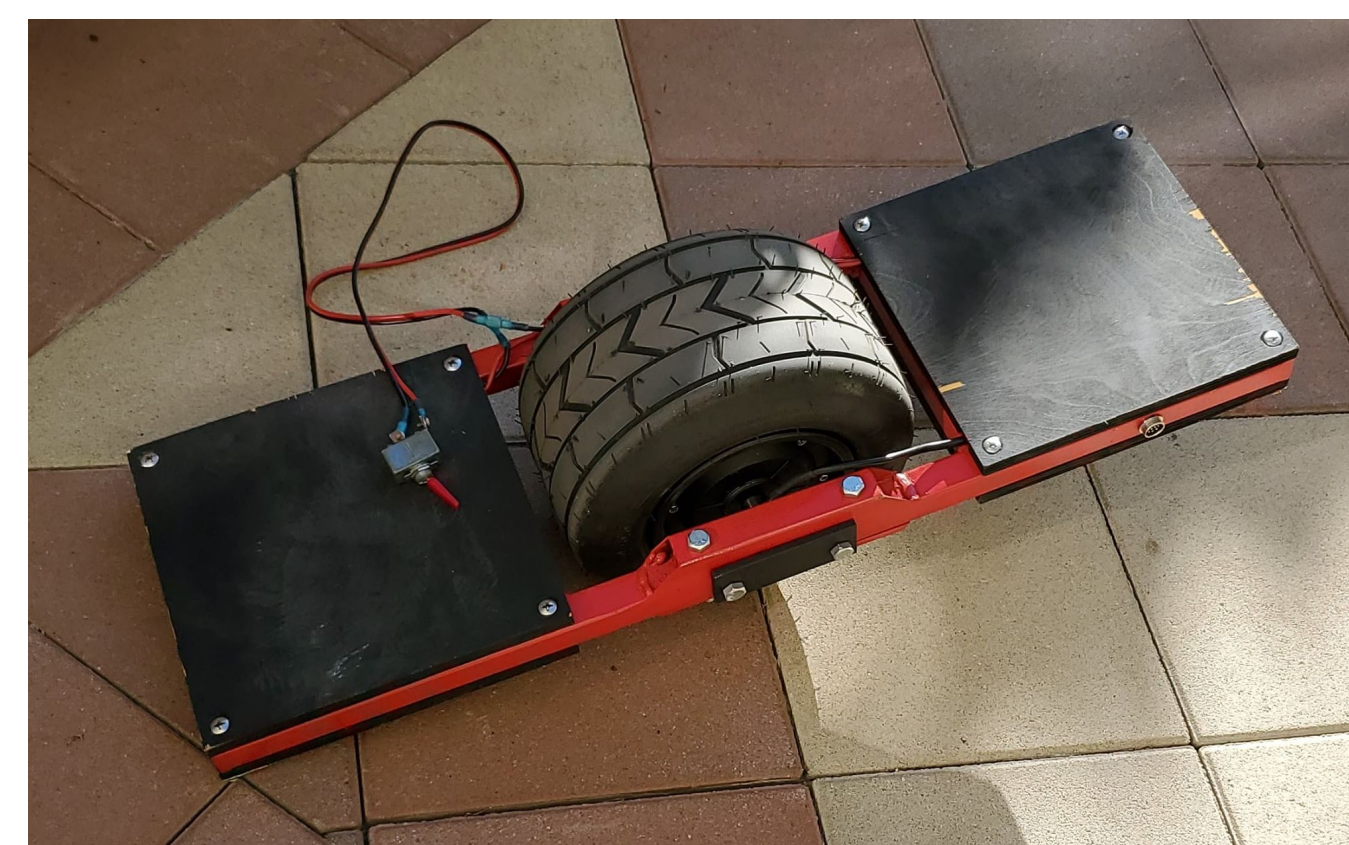
### Hardware-Software Interface



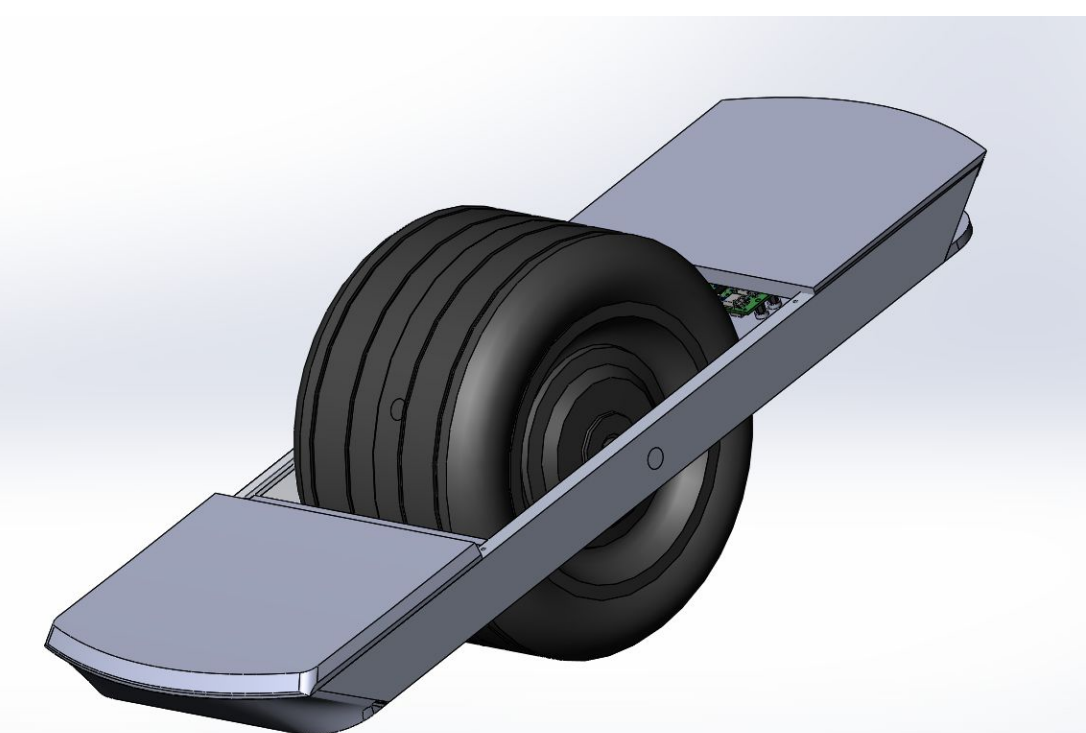
### OpenWheel Prototype and First-Generation App



### Upgraded Hub Motor



### CAD Prototype Rendering



## Results

Throughout the two quarters, we accomplished many of the original goals. Beginning with an underpowered motor and heavy casing, the current model touts a powerful hub motor and sleek 3D-printed design.

## Improvements

- Learn to use React Native
- Create cross-platform application
- Develop weight-sensing feature for automatic power-on/shut-off

## References

- [1] Idnani, Akash. "Building My Own OneWheel." *Adventures with Electronics*, 18 Aug. 2019, [akashidnani.com/2019/07/21/building-my-own-onewheel/](http://akashidnani.com/2019/07/21/building-my-own-onewheel/).
- [2] V Bharathi R Sarankumar and K Venkatesh "Singular axis self balancing system " *International Journal of Technology And Engineering System* Vol 2 pp. 45-48 Jan-March 2011.