TrailSense

A Cart that Assesses Trails for Accessibility

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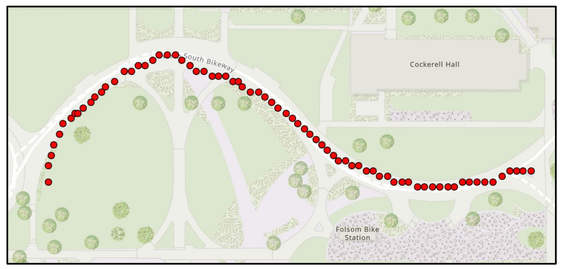
Beneficial Designs

Quality of Life+

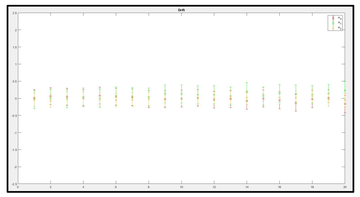
Data Collection

GPS



- Tracks user to within 20 feet of actual position

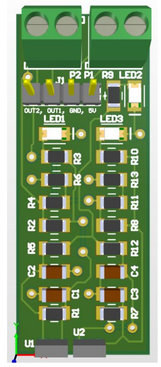
Inclinometer



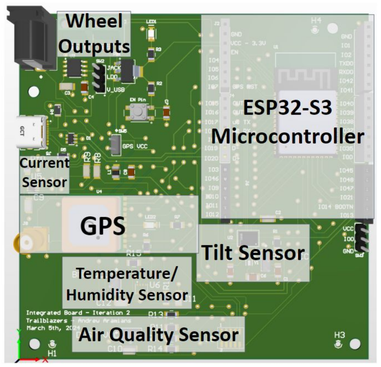
- Measures grade and cross-slope to within ± 0.35 degrees
- Stabilizes in <2 seconds after stopping
- Automatically detects significant grade changes

The TrailSense cart collects vital trail information to be used in creating maps that provide trail-goers the ability to determine whether a trail is accessible to them or not.

Hardware

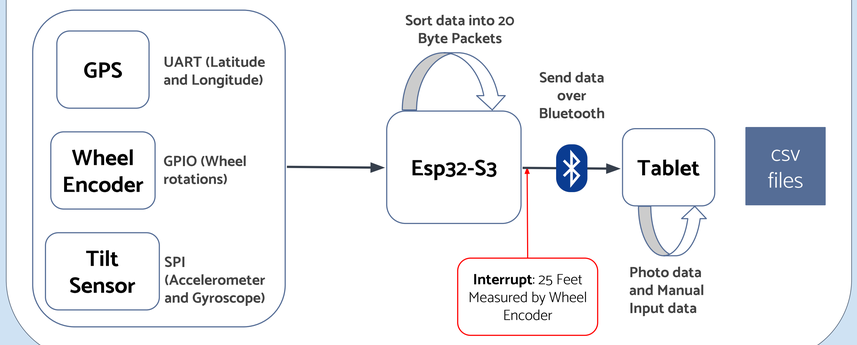


Hall Effect Sensor PCB



PCB Inside Main Sensor Box

Software Flow Diagram

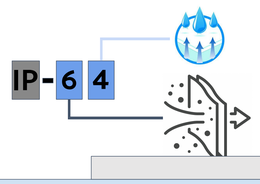


Distance

Oscilloscope measurement of falling edge from hall effect sensor

Cart wheel is loaded with 8 equidistant magnets. As the wheel rolls against the ground, a hall effect sensor on the cart detects each passing magnet and triggers a falling edge to be noticed by the microcontroller.

Enclosure



Water splashing from any angle has no harmful effect

Enclosure is completely dust-tight

Acknowledgements

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Tablet UI