

Problem

- Create a more accurate power meter
- Make it affordable

Background



The Power Tap (left) is a popular device for power measurement. It starts at \$950, no accessories included.

- Existing solutions inaccurate, expensive, or require parts replacement
- Current methods of power measurement include pedal systems, rear wheel hub strain, chain vibration, and opposing force

iitorque

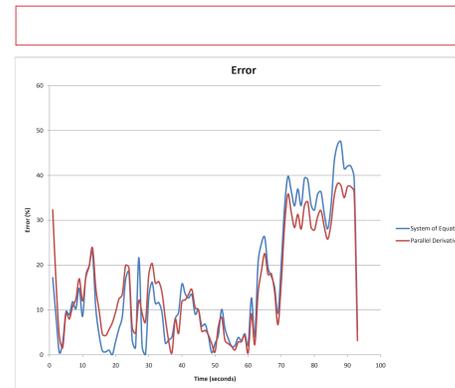
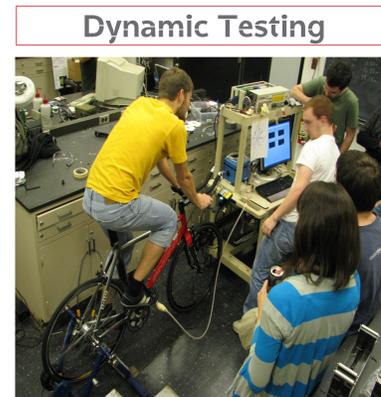
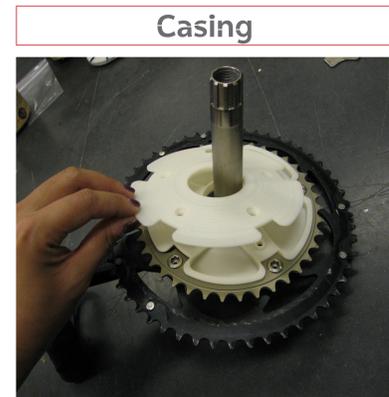
Our solution is the Integrated Intelligent Torque Measurement System.

- Torque measurement using strain gauges to achieve greater accuracy
- Attachment at the crankset to make it more affordable and more applicable to different bike types

Methods and Results

Mechanical

The Mechanical Team designed and built the casing and performed static and dynamic testing.

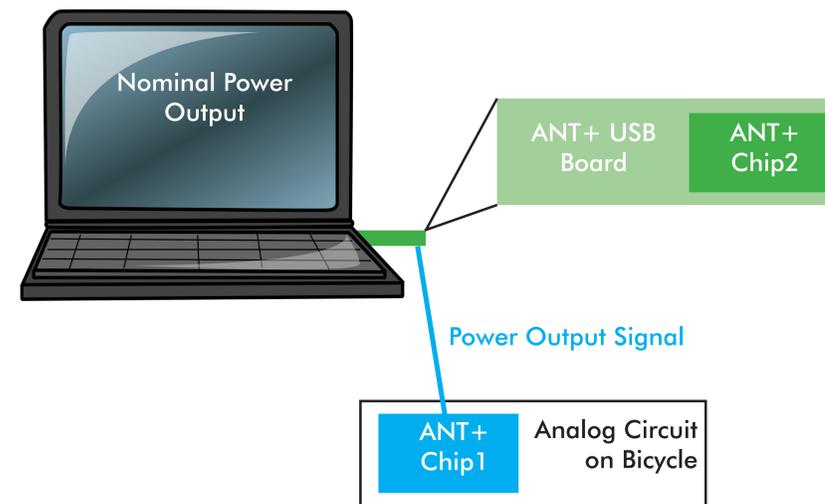


Results

- The relative error of our initial calculations is quite adequate considering the test system was not even completely calibrated

Electrical

The Electrical Team designed the circuit and wrote the code necessary to transmit and interpret the mechanical data.



Circuit outputs power signal to ANT+ chip1, which wirelessly communicates with ANT+ chip2 plugged into the computer with an interface translating the ANT+ message to a nominal Power output

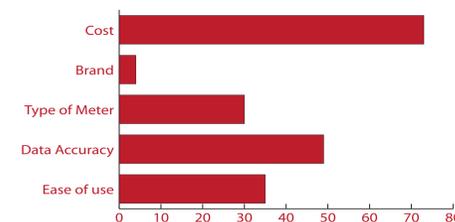
Drivetrain Basics

- Pedals rotate cranks
- Held in axis by bottom bracket
- Chain transmits power to wheel

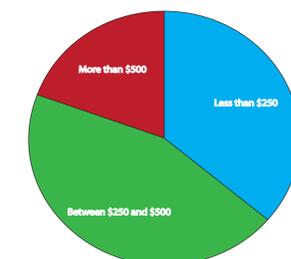


Research

The Research Team conducted a preliminary market analysis. They conducted a survey among local bike clubs.



The most important factors when buying a power meter.



The willingness to pay for an accurate power meter.