tether

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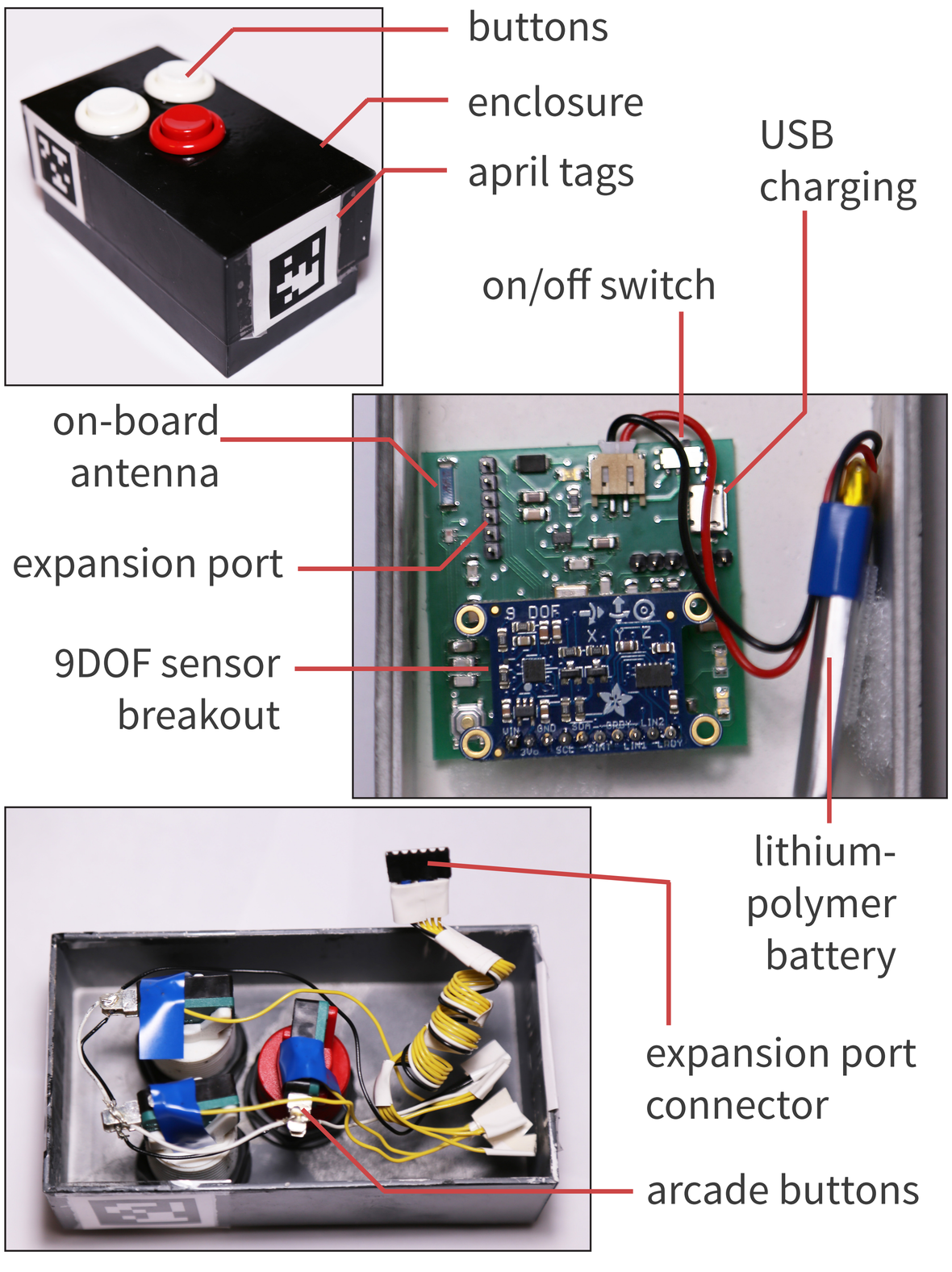
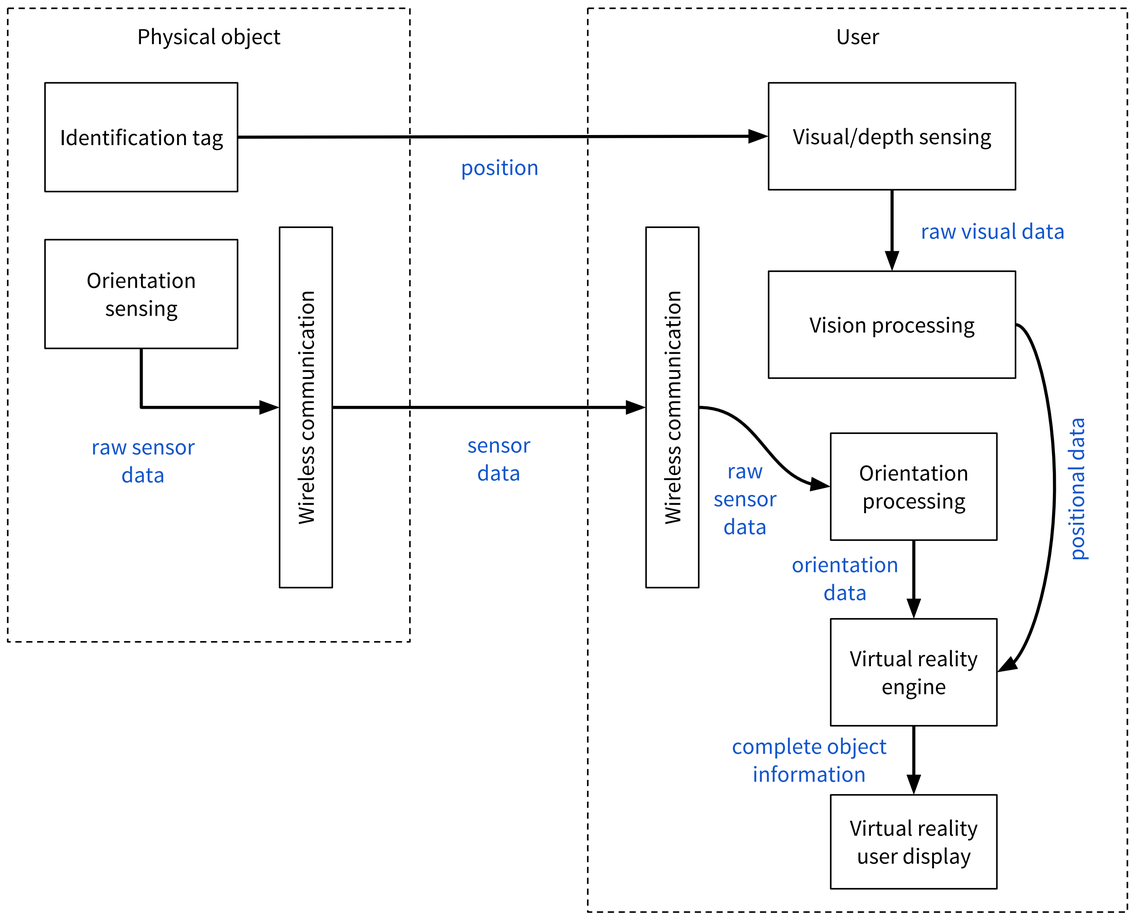
Introduction

Tether brings physical objects into the virtual world so that users can interact with them in both worlds simultaneously. Tether creates a compelling way to interact with virtual objects, which could be viable in many fields from video gaming to engineering and medicine.

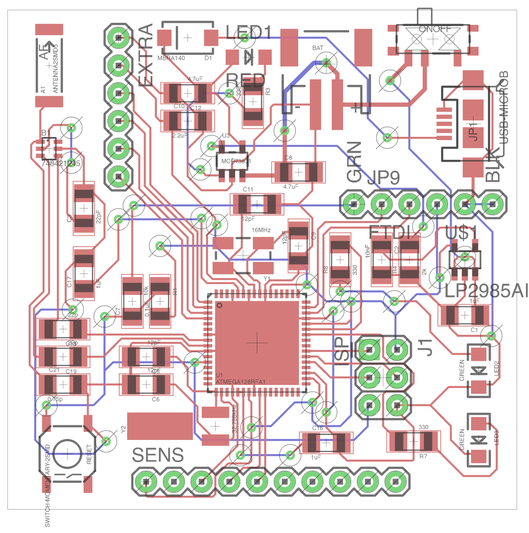
Sensor box design



Architecture



Hardware



The ATMega128RFA1 has an integrated radio, which allows us to send sensor data wirelessly using the 802.15.4 protocol. The receiver uses the same PCB, and interfaces with the computer via serial.

We connected an Adafruit 9DOF sensor breakout board to the PCB via header pins at the bottom. The expansion port on the left gives direct access to ADC so that buttons, switches and dials can easily be connected to the sensor. Additionally, the unit runs on LiPo batteries with USB charging.

We used AprilTags and a network camera to track the 3D position of the sensor box.