Authen Gate

BOUNDARIES THAT SAFEGUARD YOUR HARDWARE

Chris Armour

University of Advancing Technology

Network Security, SIP311

Geo-Fence Hardware Authentication Device

Technical Field & Background Information

Network Security

Hardware authentication, Geo-Fence Technology and Possible Encryption

Robotics/Embedded System

Wiring of prototype devices along with final PCB design and construction

Software Engineering

Programming of Arduino device, Opensource FIDO2 implementation and User Interface

Digital Maker & Fabrication

Arduino development, 3D Modeling, 3D case printing

Project Description

This project aims to create to an added level of device security by utilizing geo-fence technology to restrict login access of a hardware authentication device through GPS boundaries.

Innovation Claim

This project’s innovation will physically disable USB data transmission by utilizing GPS coordinate restrictions preset by a user

Development Plan

Phase 1: Geo-Fence

Geo-Fence Technology development utilizing Arduino, GPS Breakout board, and LED lights

Phase 2: USB Control

Implement USB Switching control with YubiKey Authentication

Phase 3: Hardware/Software Additions

Geo-fence companion app, opensource FIDO2 plans, possible device storage capabilities

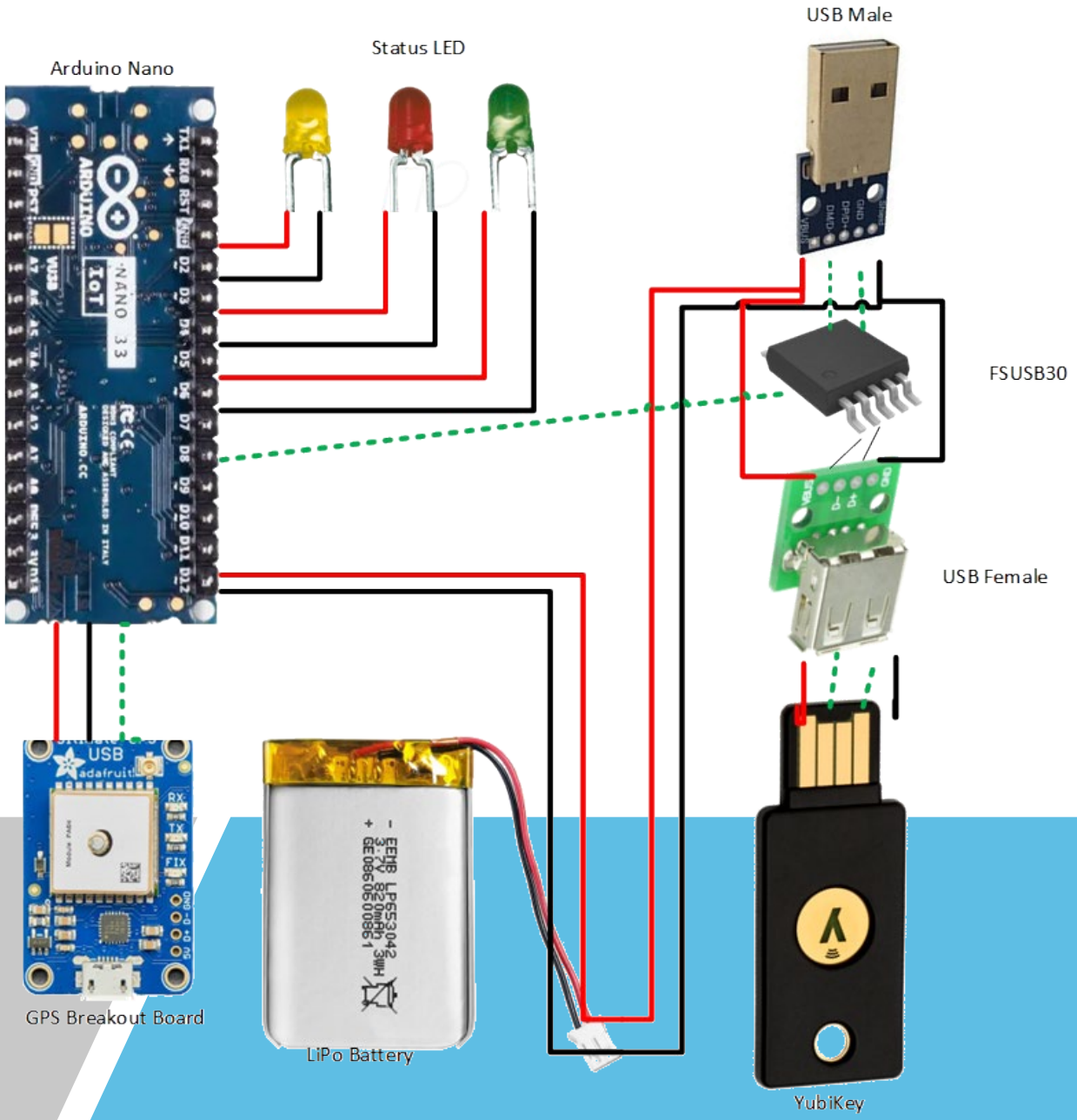
Phase 4: Maintenance and Revisions

Iron out programming, UX design, Circuit board design

Phase 5: Implementation

Final assembly and testing with custom Circuit board

Mockup


USB Male
Status LED
Arduino Nano
FSUSB30
USB Female
GPS Breakout Board
LiPo Battery
YubiKey

Target Markets

Companies with Telecommute

Limit employee workspace to predesignated safe and approved locations

Traveling Workers

Ensure that work devices can not be accessed during travel. Extra security from stolen devices

Incident Response Teams

Prevent unauthorized access of sensitive information and proprietary equipment.

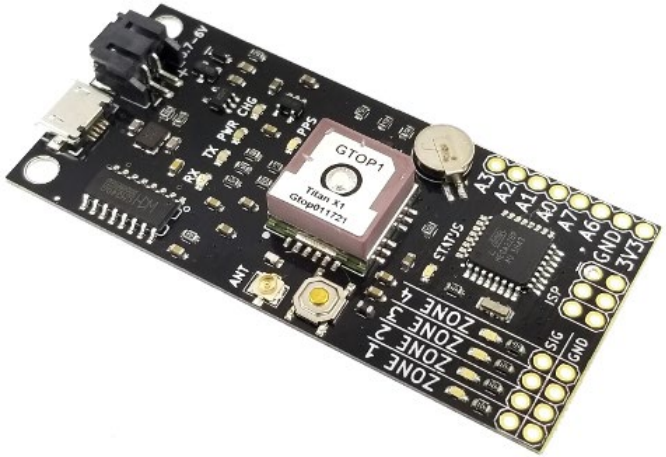
General User

Added level of security if device is stolen.

Prior Art

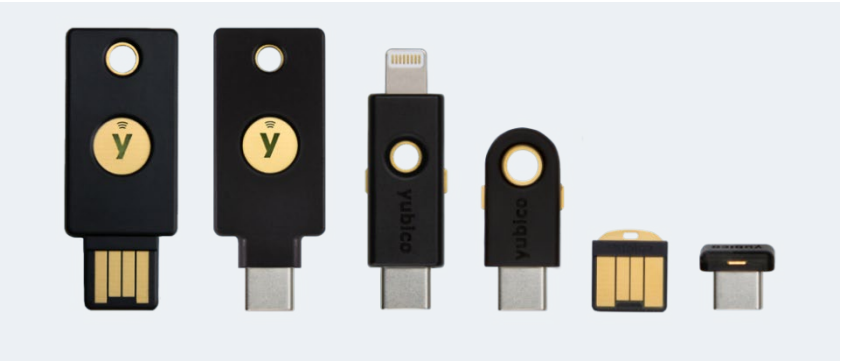
SparkX – GeoFence Widget

https://www.sparkfun.com/products/retired/14416



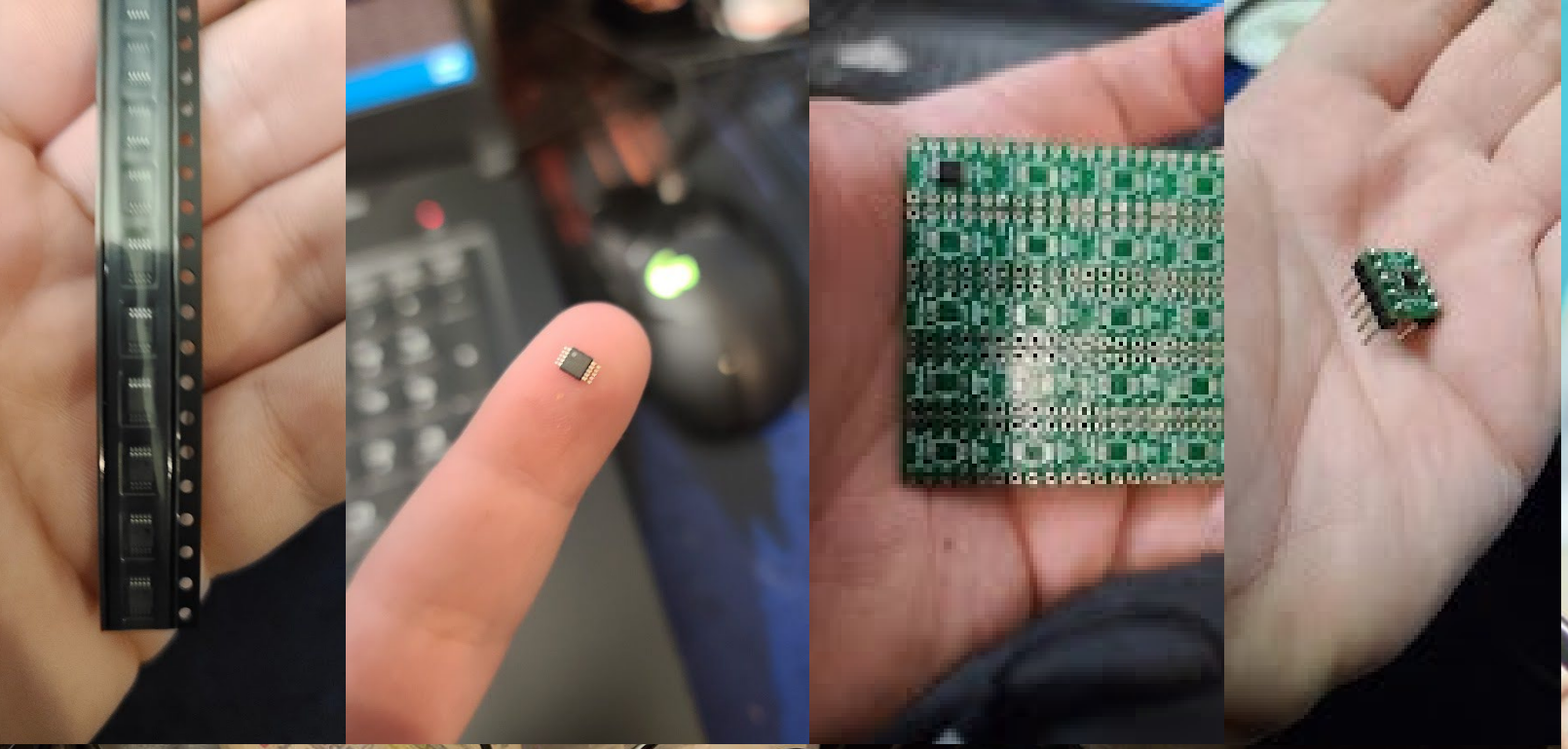
Yubico – YubiKey 5 Series

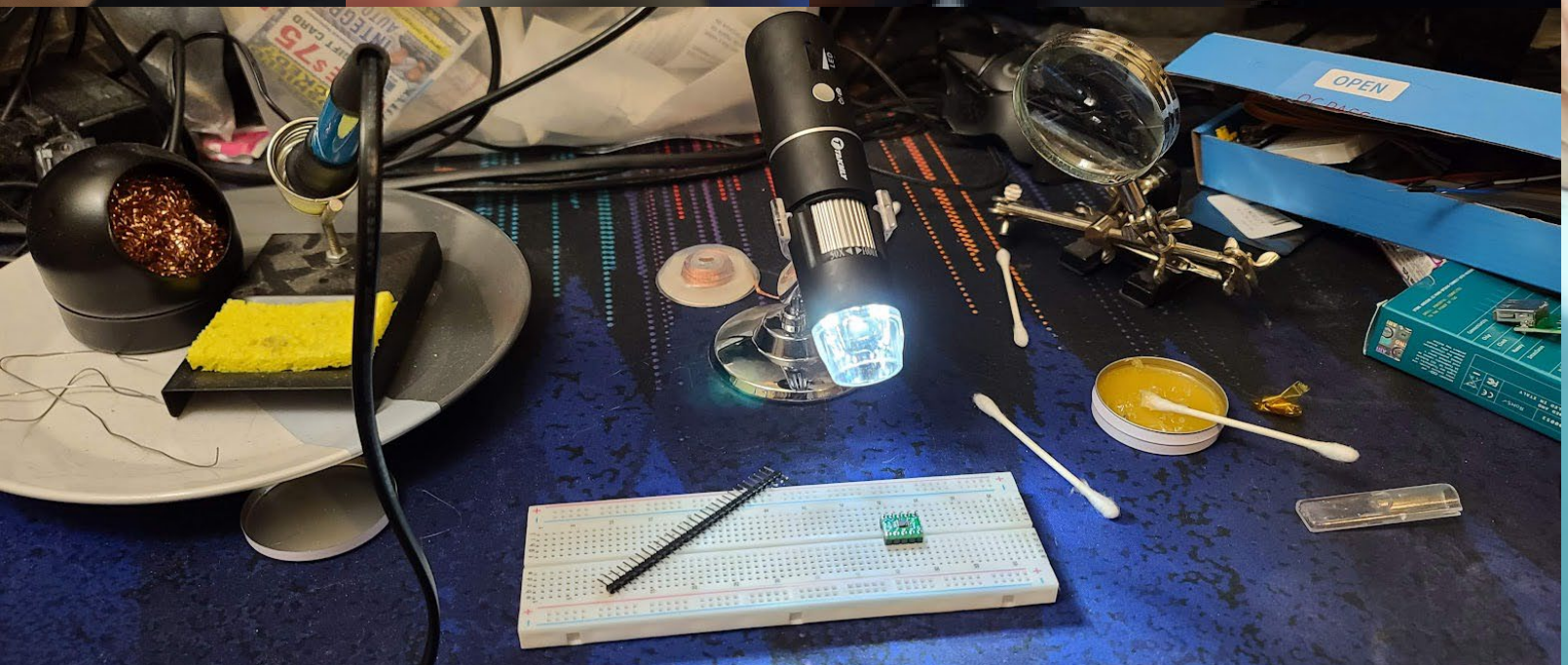
https://www.yubico.com



Updates

- All materials ordered and received for project
- FSBUSB required additional breakout and hand soldering – multiple chips lost in process
- GPS Break has trouble receiving GPS cords, external antenna required.
- GPS Coordinates transmitted and received by Arduino
- Problems with coin cell battery
- Hand Soldering of USB, Breakout and other components
- User Interface design started
- Arduino Geofence Prototype started





Development

User Interface

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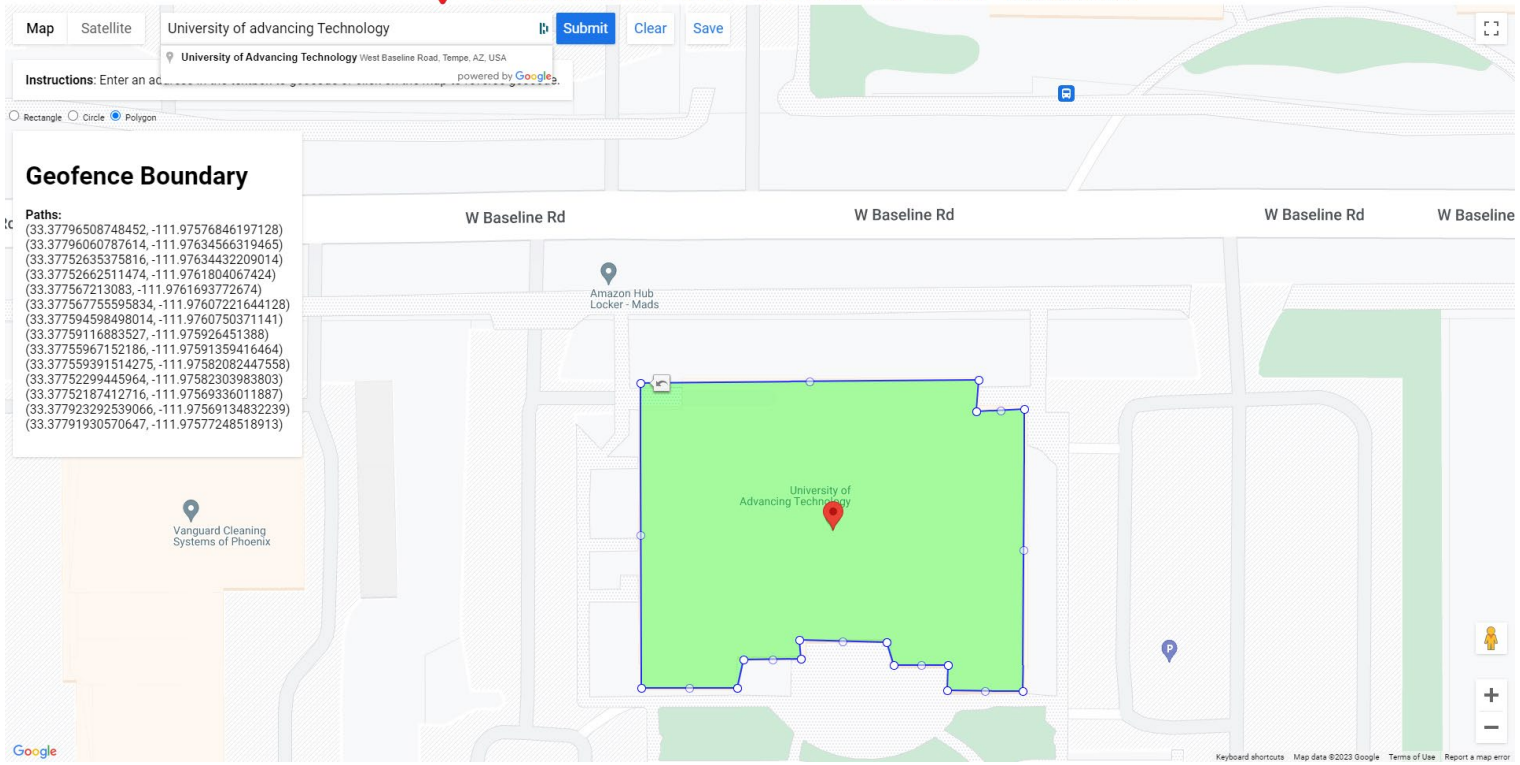

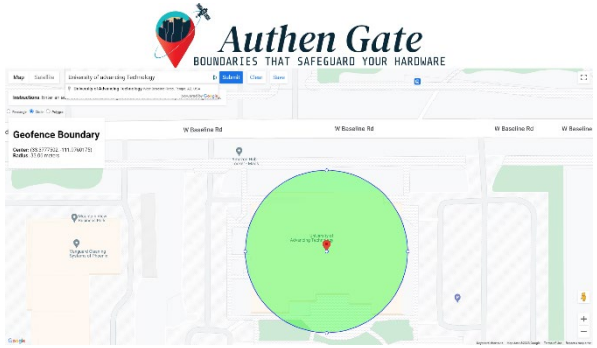

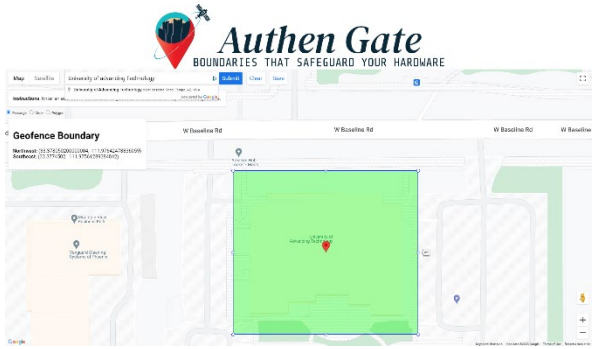

Programing output

```
Time: 00:42:18.000
Date: 17/3/2023
Fix: 1 quality: 2
Location: 3328.2424N, 11153.5449W
Speed (knots): 0.00
Angle: 265.27
Altitude: 373.50
Satellites: 13
Antenna status: 0
$GNGGA,004219.000,3328.2425,N,11153.5449,W,2,13,0.82,373.5,M,-26.4,M,,*4A
$GPGSA,A,3,29,25,18,20,12,02,05,11,,,,,1.59,0.82,1.37*03
$GLGSA,A,3,86,71,76,85,75,,,,,,,,1.59,0.82,1.37*1A
$GNRMC,004219.000,A,3328.2425,N,11153.5449,W,0.01,265.27,170323,,,D*68
$GNVTG,265.27,T,,M,0.01,N,0.02,K,D*21
$GNGGA,004220.000,3328.2425,N,11153.5449,W,2,13,0.82,373.5,M,-26.4,M,,*40
$GPGSA,A,3,29,25,18,20,12,02,05,11,,,,,1.59,0.82,1.37*03
$GLGSA,A,3,86,71,76,85,75,,,,,,,,1.59,0.82,1.37*1A
$GNRMC,004220.000,A,3328.2425,N,11153.5449,W,0.02,265.27,170323,,,D*61
$GNVTG,265.27,T,,M,0.02,N,0.04,K,D*24
Geofence type: Rectangle
Inside geofence!
Distance from geofence boundary: 0.00 meters
Latitude: 33.470706
Longitude: 111.892417
Geofence boundary NW corner: 33.47, 111.892547
Geofence boundary SE corner: 33.470462, 111.89
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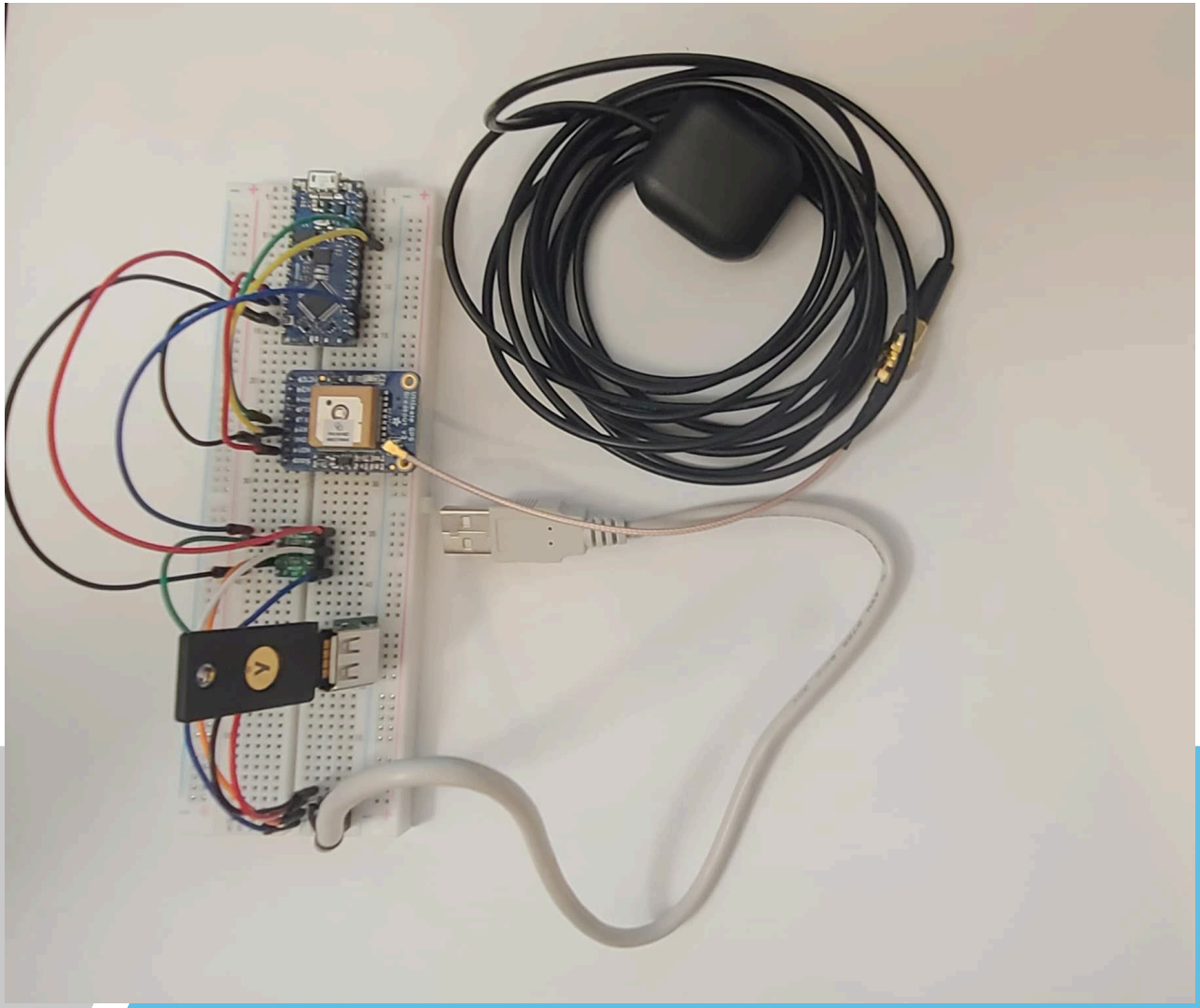
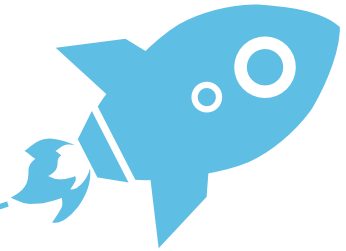
Prototype



Thank You For Your Consideration
Q&A



Chris Armour, Network Security Innovation Claim

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