Secure Traveler



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The Problem

- We forget things, lose things, divide our limited attention, and make choices we later regret.
- Traveling tourists are prime suspects for theft.
- Our antiquated methods need to be improved as size decreases and price increases.
 - Retracing your steps
 - Asking others and security
 - Assuming you forgot to bring it
 - Hoping for a good samaritan to find it

Our Solution

- Secure Traveler
 - Device
 - PCB
 - Audio
 - Adafruit Feather 32u4 Bluefruit LE
 - Power Supply
 - Smartphone
 - iOS Application
 - Database
 - Google Firebase



Block Diagram



Proposed FPR Deliverables

- Completed custom PCB
 - Speaker
- Device enclosure
- Push notifications
- Completed application
 - Settings tab
 - Google sign out, unregister devices
 - On/Off switches for bluetooth, push notifications, GPS sharing
 - Background scanning of devices

Secure Traveler Data

- Dimensions:
 - Length: 2.36 inches
 - Width: 1.38 inches
 - Height: 0.79 inches
 - Volume: 2.57 cubic inches
- Power Management:
 - Battery: 3.7V 150mAh
 - Speaker active: 0.55 mA

- Weight
 - 1.3 ounces
- Battery Life
 (BLE + speaker)
 - Formula:

(mAh/mA)*0.7 Battery cap/load current*(0.7) (150mAh/4.77mA)*(0.7) = 22 hours

Secure Traveler Speaker Data

- Speaker Power
 - 2.42 µW
- Speaker Distance
 - 44.42 Meters Outdoors
 - 35.76 Meters Indoor
 - 20.95 Meters Through 1 Wall
 - 18.16 Meters Through Backpack

- Sound Level
 65-70 dB
- Speaker Dimensions
 - Diameter: 1.1"
 - Circumference: 3.5"
 - Weight: 6g

Secure Traveler Server Data

- Advanced Encryption Standard (AES)
 - 256-bit key
- Encrypted Data
 - Location Coordinates
 - Device Name
 - Email Address

Secure Traveler Specifications

Requirement	Initial Projections	Final Product	
Connection Range (Indoor/Outdoor)(Meters)	30 Meters Indoors 40 Meters Outdoors	Min: 20 meters, Max: 36 meters Average: 36 meters	\checkmark
Audio Range (Indoor/Outdoor)(Meters)	35 Meters Indoors 45 Meters Outdoors	Approx 36 meters Indoors Approx 45 meters Outdoors	
Battery Life (Months)	2 Months	22 hours	×
Weight (Ounces)	16 ounces	1.3 ounces	\checkmark
Size (Cubic Inches)	6 cubic inches	2.57 cubic inches (2.36 x 1.38 x 0.79)	\checkmark
Server Connections	50	100	\checkmark
Response Time (Seconds)	1 second	Less than a second	\checkmark
Cost per Unit	\$25	\$44.01(1) - \$35.80(100+)	×

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Secure Traveler Parts

Adafruit Feather 32u4 Bluefruit LE

Price: \$29.95 Price of 100+: \$23.96

TI LM386N-1 Audio Power Amplifier Price: \$0.53

Lithium Ion Polymer Battery

Price: \$5.95 Price of 100+: \$4.76

Adafruit Mini Metal Speaker

Price: \$1.50 Price of 100+: \$1.20

OSH Park PCB

Price: \$3.80

Hammond Manufacturing Enclosure

Price: \$2.28 Price of 100+: \$1.58

Demonstration

- Google Sign In
- Register/Unregister Device
- Encrypted Data on Server
- Display location
- Change Device Name
- Audio Playback
- Settings
- Background Scanning

Audio Amplifier Diagram



Notification Demonstration

Plays sound when it leaves Bluetooth range(Backup)



Audio Demonstration

Play sound from the App(Backup)



Questions?