Project Portunus
Universal Car Module
Problem

▸ New cars have partner apps to control the vehicle
▸ Apps specific to manufacturer
▸ No universal mainstream solution
Problem

▸ Plug-n-play module
▸ Wireless lock/unlock
▸ GPS tracking
▸ Diagnostics
Pi 40 Pin Holes
CAN Controller

CAN TX/RX
DB9 Port

Buck Converter

Power Diode
80 X 35mm board
4 layer board
Single sided mounting
Powered by car's 12V line
How do we talk to the car?

- CAN - Controller Area Network
- All modern car systems use CAN
- OBD II diagnostics port open to user
- Sniff CAN messages via OBD II
Car Control and Diagnostics

- Use OBD II to interface with CAN bus
- Determine CAN frame behavior
- Store Important ID’s
- Finding ID ≠ Car Control
GPS Tracking

- Send GPS data to Firebase and access it directly through the app.

- Create a cellular connection to the internet using the mobile network.
- Get locational data both from GPS and GSM module.

Firebase
Mobile App

- Android application done using Android Studio
- Retrieves diagnostics over Firebase
- Organize GPS data and plot
Mobile App Cont.

Portunus

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GPS Coordinates

Pair(34.4162023, -119.8481601)
Pair(34.417449, -119.848456)
Pair(34.418053, -119.8482244)
Pair(34.4187233, -119.8481735)
Pair(34.4190832, -119.8476711)
Pair(34.25073814, -119.5086171)
Conclusions

- Established a connection to the car’s CAN BUS
- GPS and diagnostics data is transferred to the phone app regardless of car’s location
- Locking and unlocking the car is feasible with certain models
Thank You!

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Questions?