Aftermarket Child Detection for Car Seats

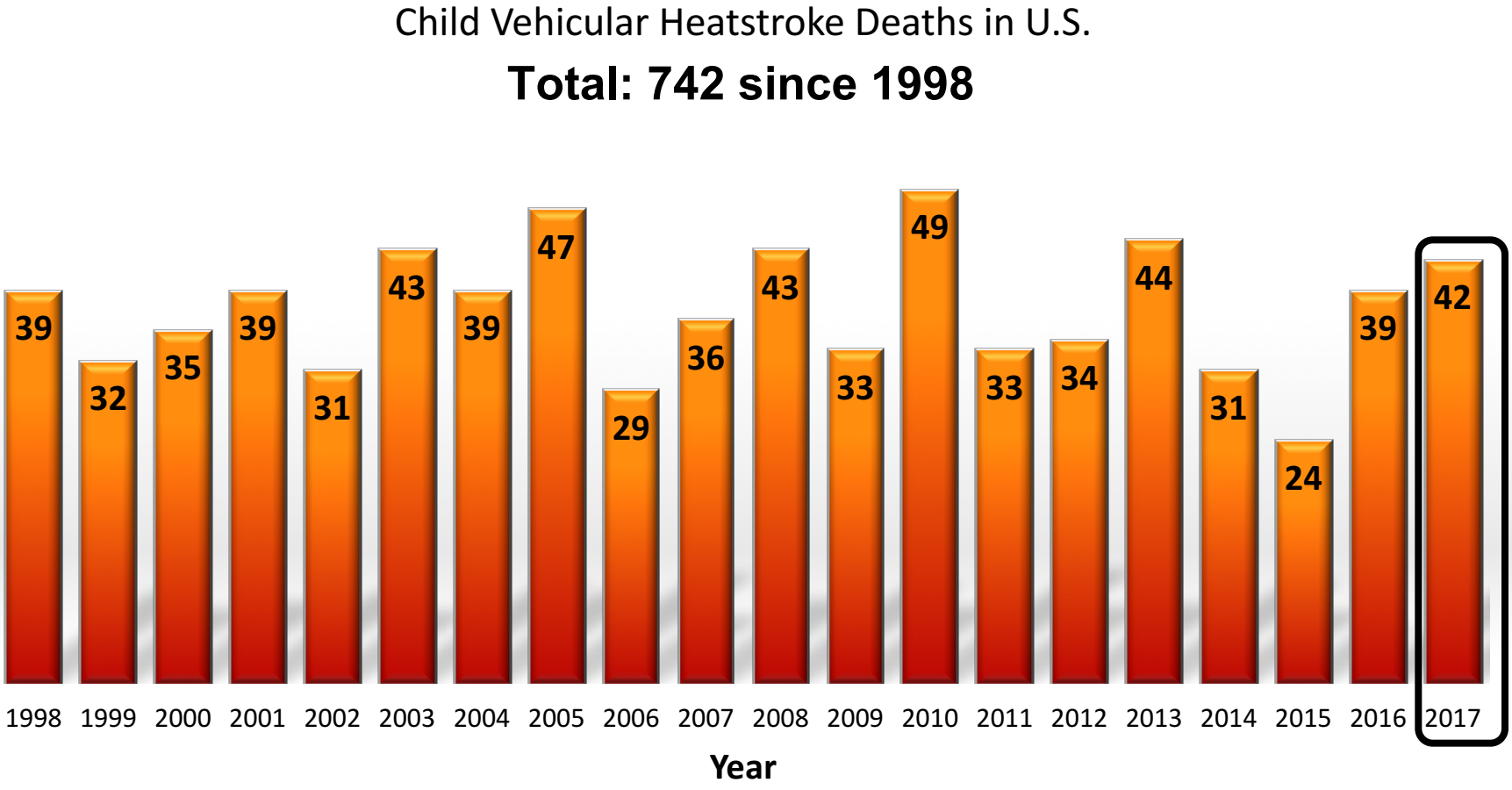
Design Review 4

Presenting:
Stephen Carr, Justin Craig, and Spencer Nguyen

Overview

- Project Summary
- Project Scope
- Hardware Design
- Software Design
- Conclusion

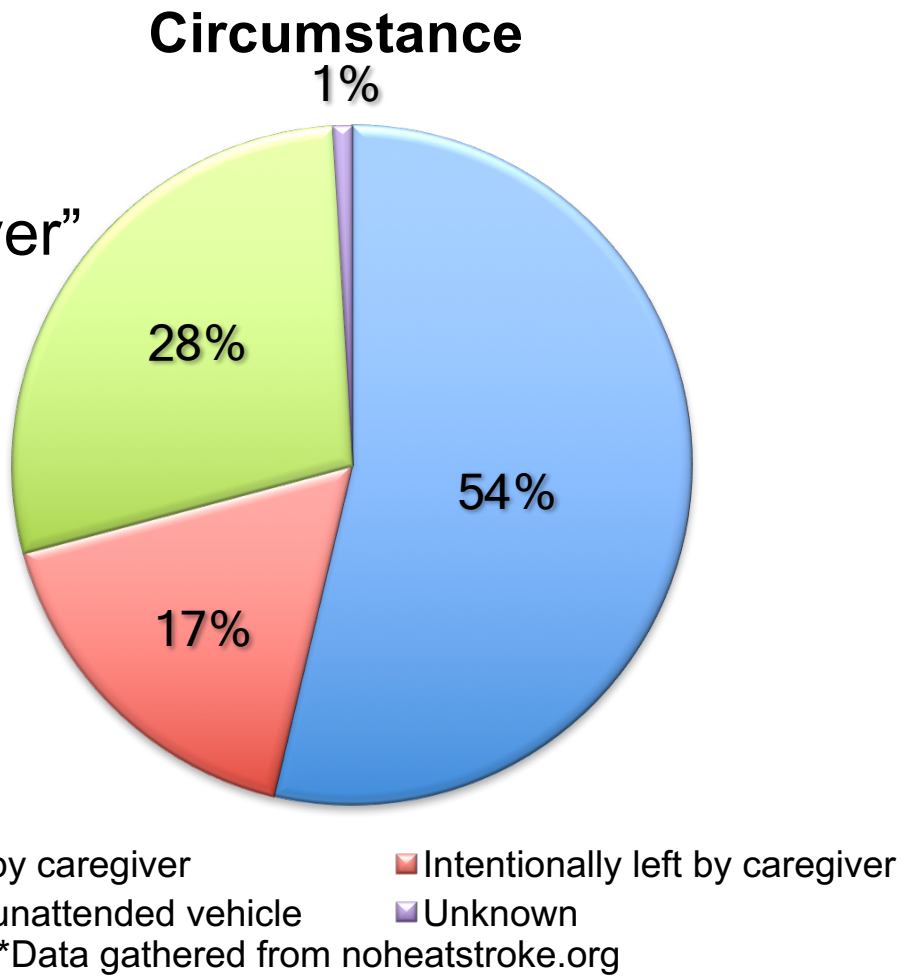
Project Summary



*Data gathered from noheatstroke.org

Project Summary

- Focusing on:
  - "Forgotten by caregiver"
  - "Intentionally left by caregiver"
- 71% of all cases



Project Scope

- Develop a device that detects if a child is left in an unattended vehicle that is subject to dangerous conditions
- Primary goals:
  - Reduce infant fatalities
  - Raise awareness
  - Develop prototype
  - Universal Adaptability
  - Tap into undiscovered market

Project Scope

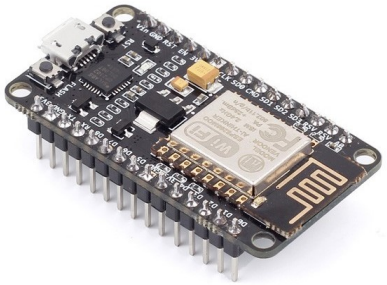
- Primary Market: Parents/guardians with children who use car seats
  - Persona Development
  - Legislation currently being worked on requiring daycare vans to have alarms
- Secondary Market: Baby product manufacturers and car seat manufacturers

Now Presenting:

Spencer Nguyen

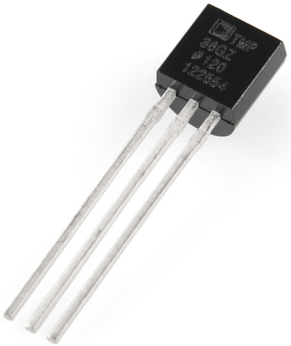
Hardware

Vehicle Module



ESP8266 Microcontroller

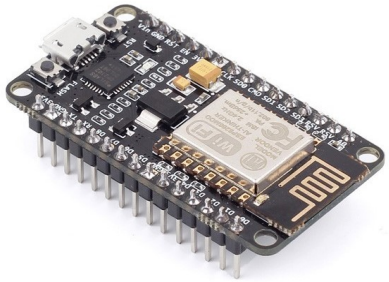
Pressure Mat



TMP36 Temperature Sensor

AA Battery Holder

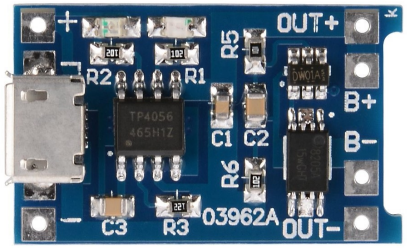
Key Fob



ESP8266 Microcontroller

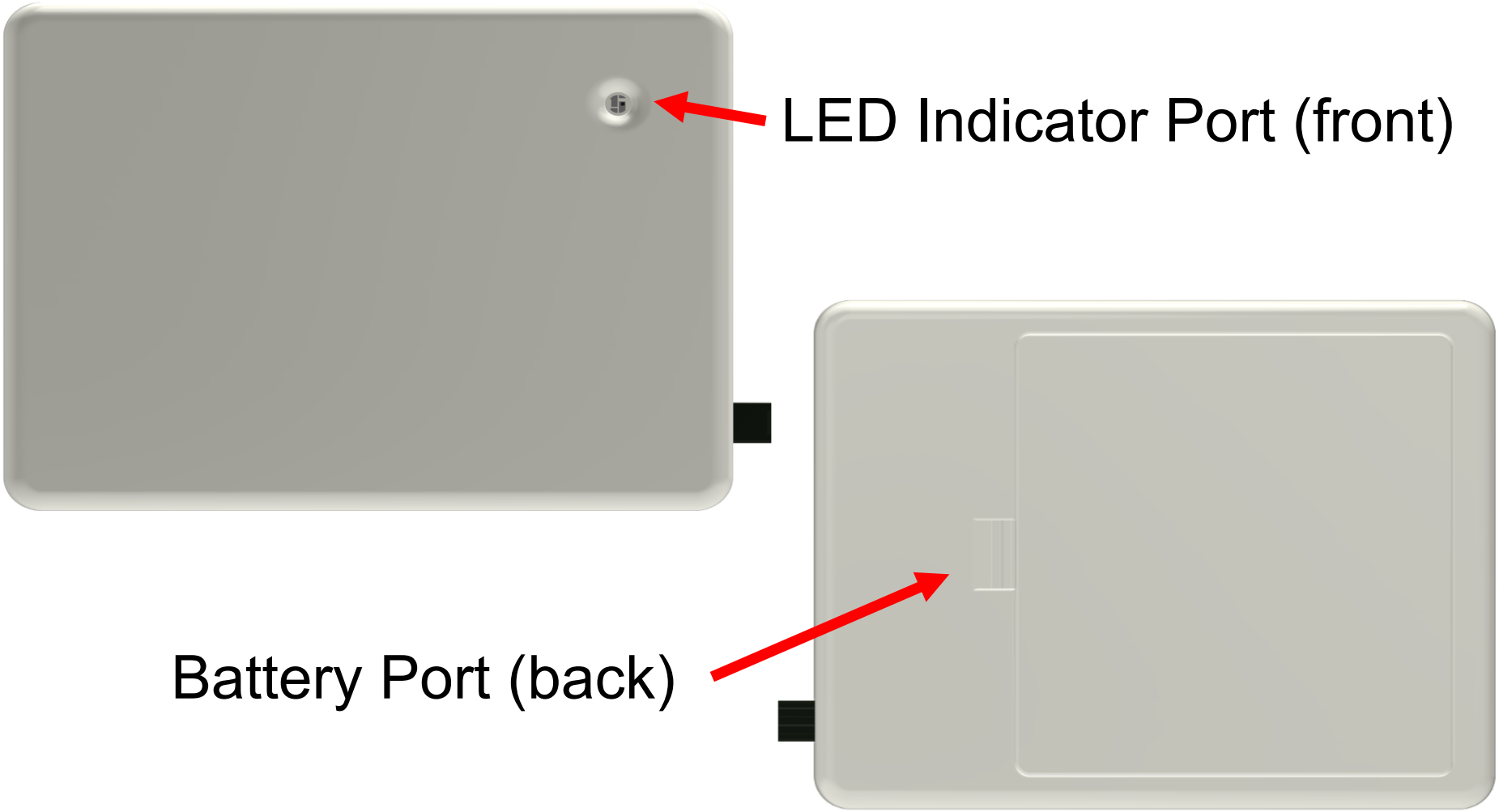
Piezo Alarm

3.7V 800mAh LiPo Battery

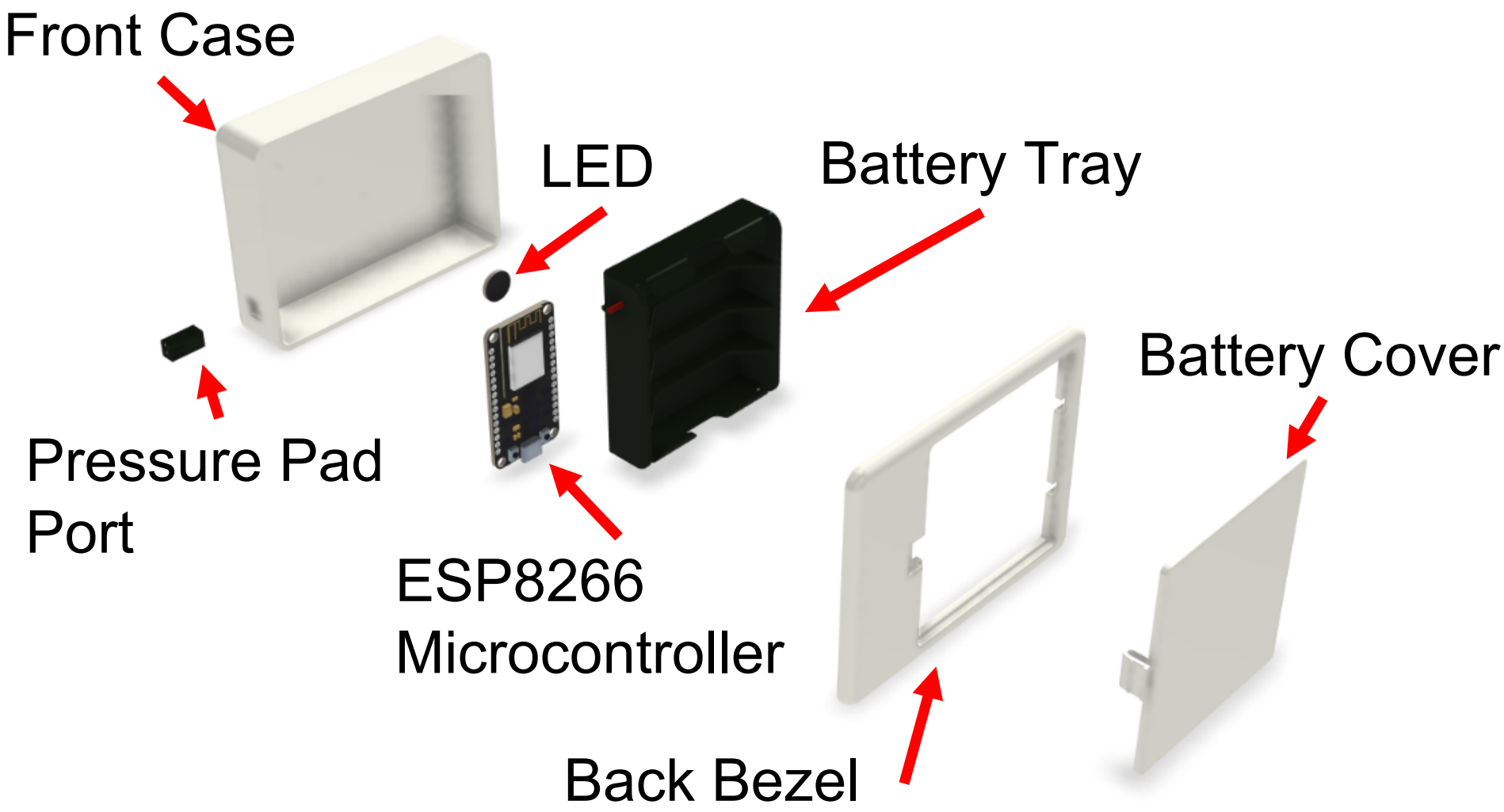


TP4056 Charging Board

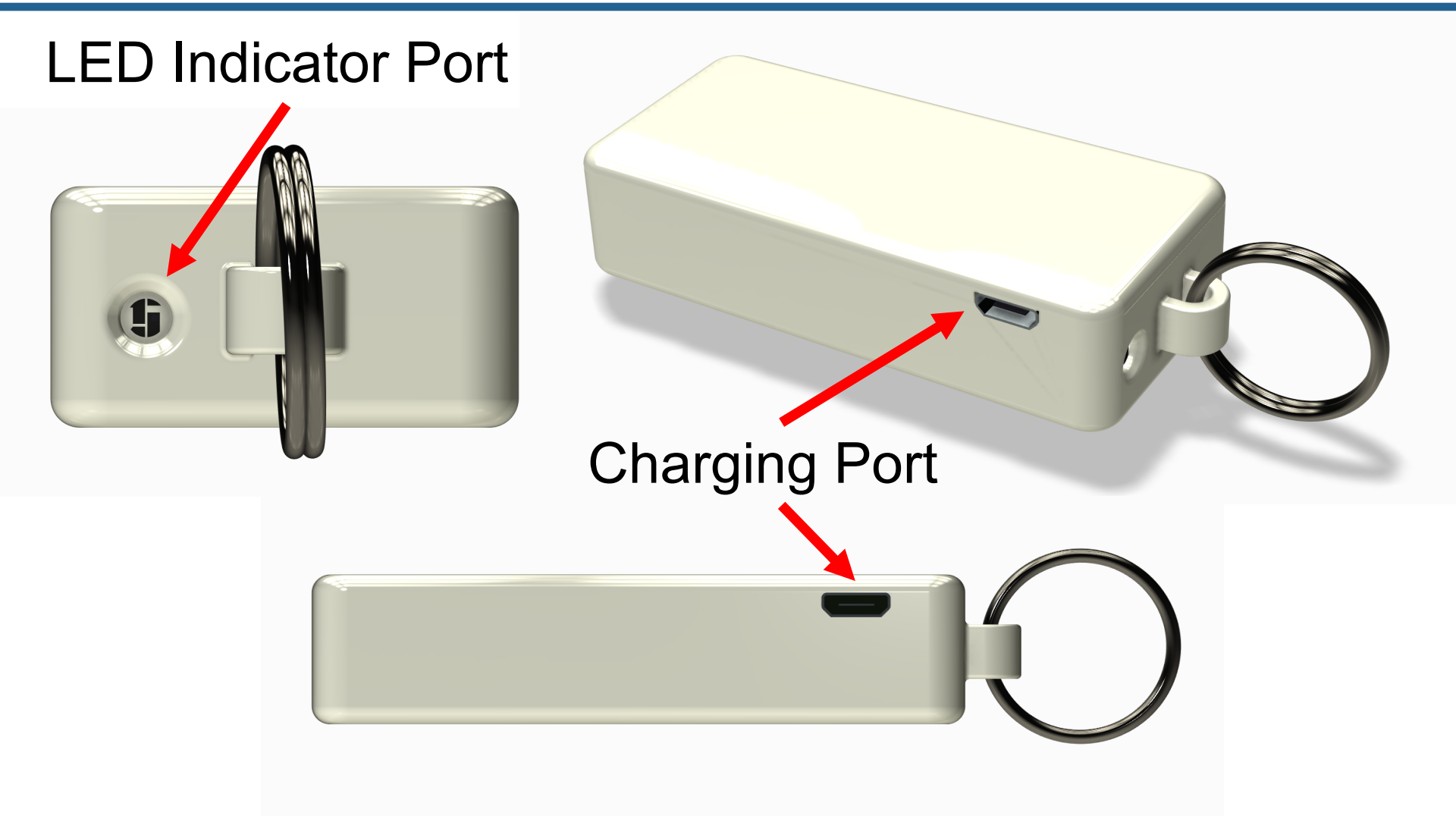
Vehicle Module Housing



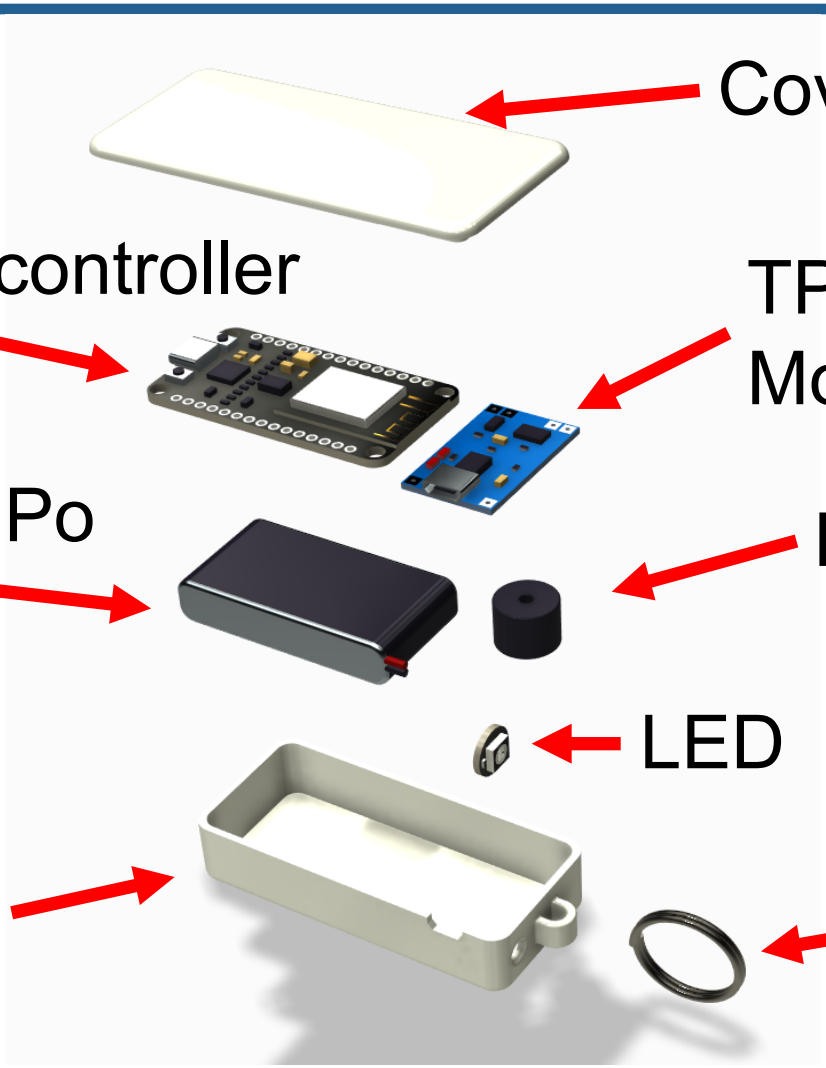
Vehicle Module Housing



Key Fob Housing



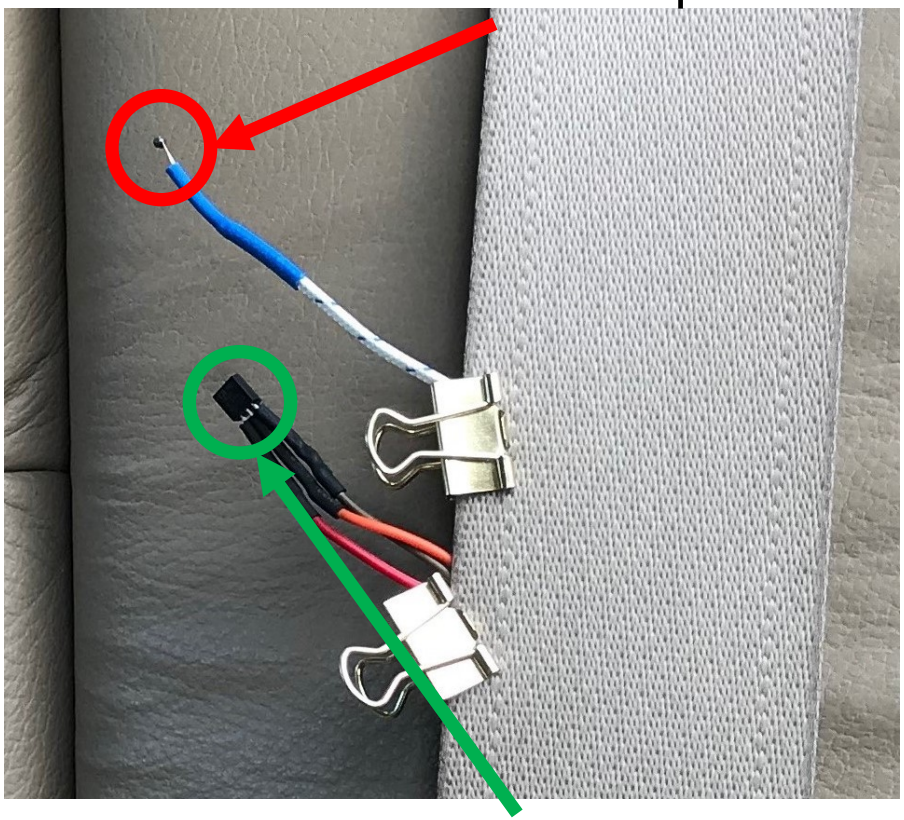
Key Fob Housing



Temperature Experimental Setup

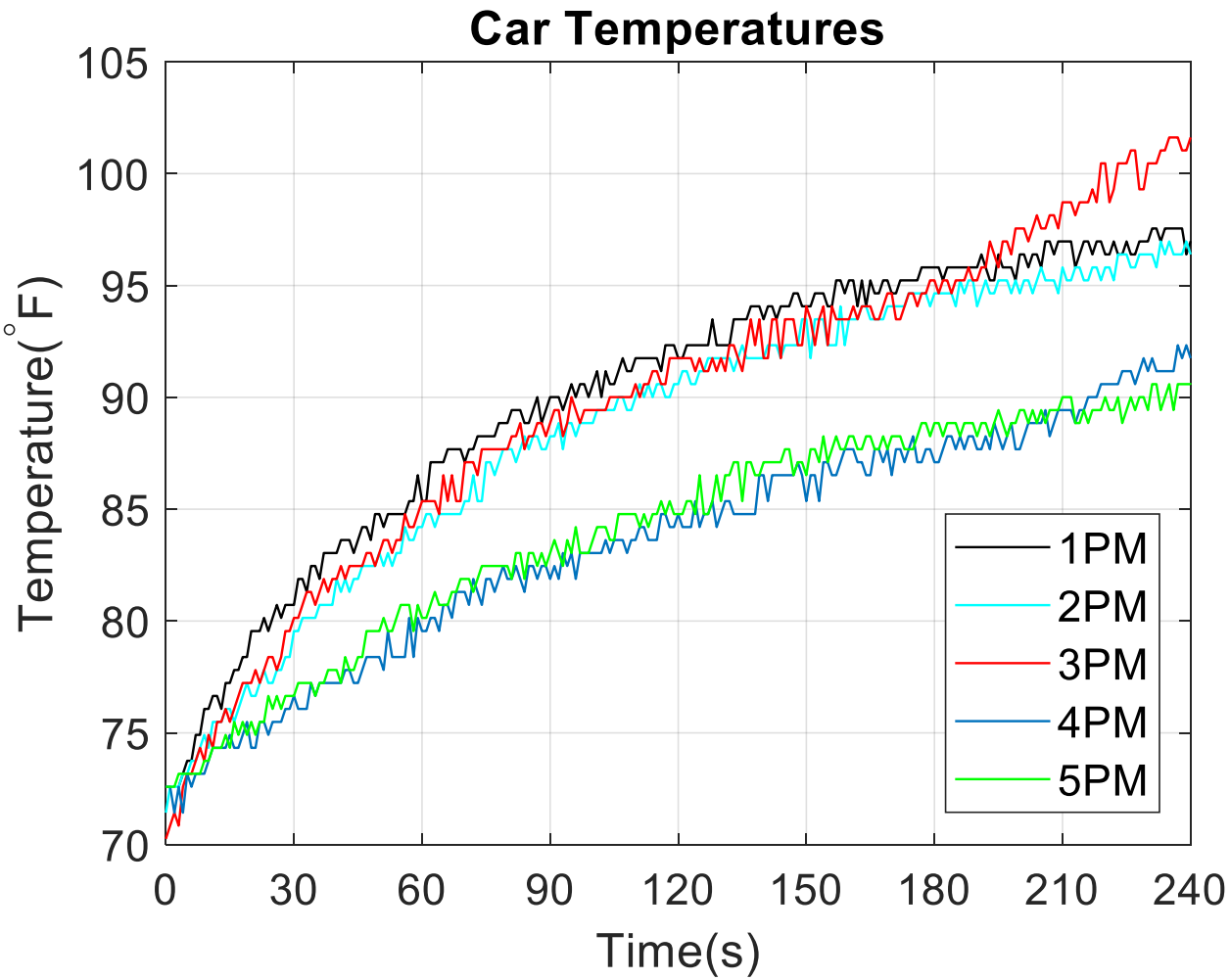
- Vehicle placed in direct sunlight
- Temperature recorded in the back seat of a sedan with no window tint
- Weather: Partly cloudy
- Ambient Temperature: 76°F-80°F
- Vehicle interior air allowed to cool to 72°F before shutting off the engine

Multimeter Thermocouple



TMP36 Temperature Sensor

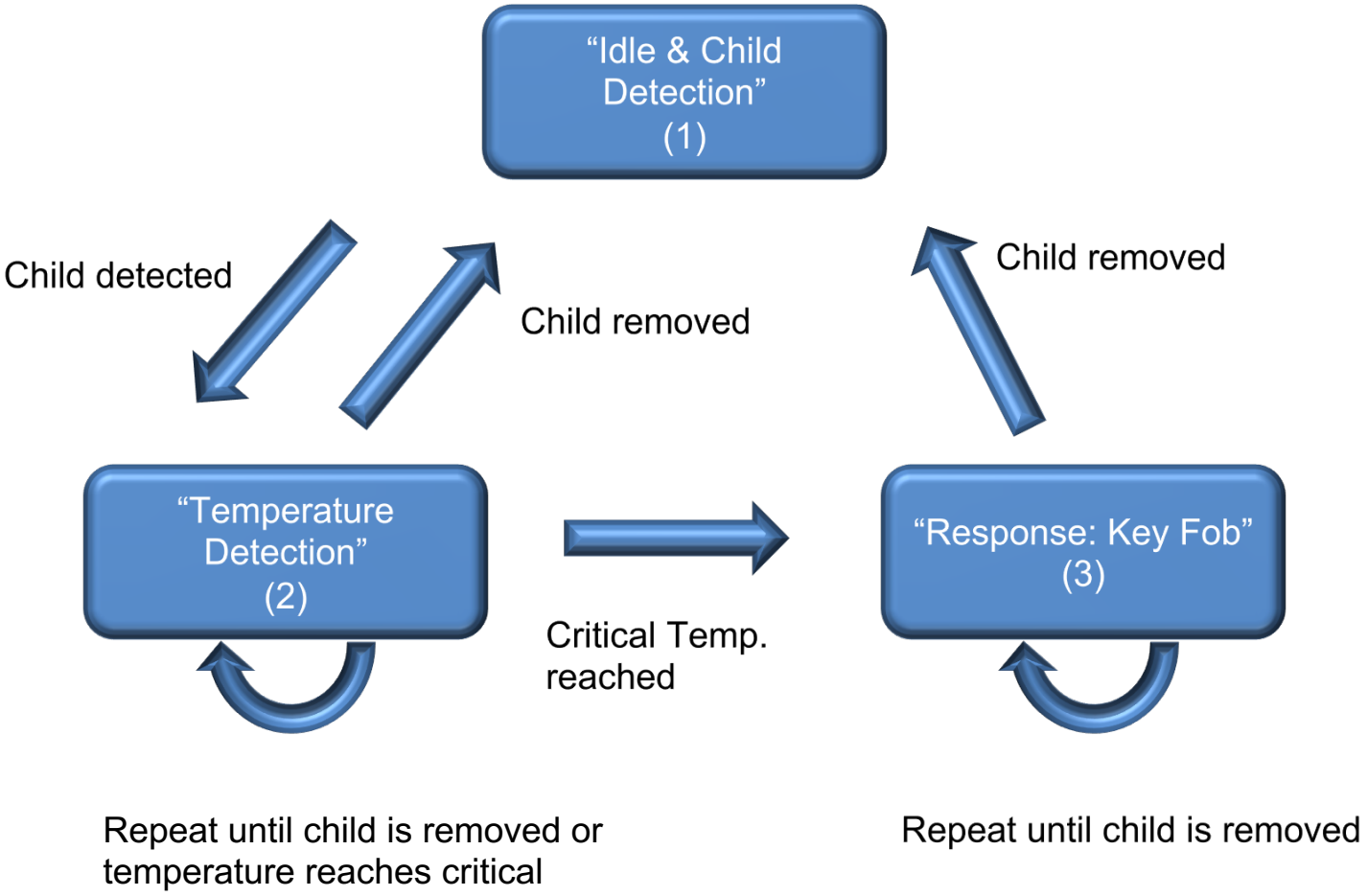
Vehicle Temperature Data



Now Presenting:

Justin Craig

State Diagram for Software Design



Code Progression

- Idle and Child Detection
  - Pressure pad
  - Interrupt ✓
- Temperature Detection
  - Read Temp. Values ✓
  - Store values ✓
  - Interpret slope ✓
- Response: Key Fob
  - Communication ✓
  - Alarm/LED ✓

Future Work

- Working prototype by the end of February
- Debugging and testing in March
- Finalize prototype in April
- COE Shark Tank Competition

Conclusion

- Parts ordered and received
- Housings designed
- Software near completion
- Functional prototype expected by the end of February

Questions?

References

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4. Temperature Sensor - TMP36 [Digital image]. (n.d.). Retrieved February 18, 2018, from https://www.sparkfun.com/products/10988

5. Tattu 6pcs 3.7V 800mAh 25C 1S LiPo Battery Pack with JST Plug [Digital image]. (n.d.). Retrieved February 18, 2018, from http://a.co/6doCOsj

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