Potential Project Ideas:

1. Fix regen system
    a. Driver cannot fault car for whatever reason
    b. Hardware
        i. Motorboard
            1. Small revisions
    c. Software
        i. Motorboard ‘Debounce’
        ii. Communication between BPS and motor controller
    d. Pros
    e. Cons
2. SOCs
    a. Battery State of charge in car
    b. Stretch goal
    c. Add on the other project
    d. Hardware
        i. Small project
        ii. Coulomb counting on a per cell basis
        iii. A lot of math and statics
    e. Software
        i. A lot of calculations and reading data
    f. Pros
    g. Cons
3. Battery charaterizer
    a. Characterizes each battery
    b. Hardware
        i. Current & voltage of battery
        ii. Coulomb count
        iii. SOC
        iv. Scalable
    c. Software
        i. Collect data
        ii. Send to DB
        iii. High level
    d. Pros
        i. A lot to do
        ii. Has a lot of similarities to SOCs
    e. Cons
        i. Huge pivot

System 1 (Fix regeneration through motorboard)

- Motorboard inputs from BPS
    - Pack current
    - Pack voltage
- Motor analog inputs
    - Rotary switch
        - Neutral, Drive, Reverse
- Limit
    - Brake
    - Regeneration
    - Accelerating
- Motorboard outputs
    - Drive commands
    - Brake lights
    - Drive mode
- Spec new part
- Build hardware failures
    - Encoders
        - Physically
        - Encoding error
    - CAN
    - Connectors
- Motor controller configurations

System 2 (Battery characterization)

- Scalable
- A communication
- 18650 battery size
- Safety
- Charge
- Discharge at a set current
- Self-monitoring
- Display
- Track data
    - Voltage
    - Current
    - Time
    - Cell ID
- Track data into some database
- Connect to the internet
- Plug into wall
- Enclosed
- Cheap master

- Master
    - AC to DC
    - Wifi
    - Display
    - User interface
    - LEDs
    - Safety cut-offs
- Slave(s)
    - Display?
    - 18650 holder
    - Charge/Discharge stuff
    - Measurements