**Systems**

-Arduino 328P

- On-body Sensors

- Motor Control

- 3.3v

-Raspberry Pi 3

- Watson Services

-Arduino 328P

- Austin’s gestures and emotion

- 5V (?)

-Camera module hardware (please fill in specs)

- Camera for facial recognition and emotion detection

-What is running ML?

- Same raspberry pi as for Watson?

**Consolidation**

-What systems can be merged?

-Austin personality with on-body sensors and motor control

- Leaves us with Raspberry Pi, 1 Arduino, and the camera module hardware

**Communication between systems**

-Serial?

**Protocol**

* **Start up** 
  + Checks for sensors (ok(?))
  + Checks for Camera data (ok(?))
  + Austin’s start up gestures (?)
  + Check Watson
    - “Austin, tell me a joke”
    - Responds with cheesy joke fetched from Assistant
    - This Checks mic, speaker and Watson services
* **Pressure calibration (See Watson Conversation)**
  + Inflate belt and have user stop the belt inflation - capacitive touch
  + Save data for future use
* **Watson Conversation** 
  + Pre-programmed Commands
    - “Austin, who is that”
      * Confusion gesture
      * Returns name of face identified (text to speech)
    - “Austin, read emotion” (Speech to text)
      * Serial Commands communicate with camera hardware to get emotion string
      * Eyes glow in varying pattern
      * Returns detected emotion (text to speech)
    - “Austin, Calibration” (Speech to text)
      * Serial command to Arduino to trigger inflation
      * Wait for Cap Touch interrupt
      * Store pressure sensor value as MAX\_PRESSURE
    - I think this is enough for demo
* **Austin Personality**
  + Pan and tilt gestures
    - Yes/agreement
    - No/Disagreement
    - Confusion
      * Verbal commands not recognized
  + Expressive Eyes
    - Work with Alex on color coding to emotion,
* **Sensor data flow to ML** 
  + What is the best pipeline, or should we consolidate the sensors with the hardware running ML?
* **ML result to controller** 
  + If *Stress* LOW
    - Do nothing/ Don’t care
  + If *Stress* Moderate
    - How does it send this command to the main controller?
    - How does main controller send command to Arduino
    - Trigger haptics
      * Breathe for 10 seconds
  + If *Stress* high
    - Trigger DTPT belt
      * Must stay inflated for a period of 20 minutes to be considered effective
      * Wearer may deactivate using capacitive touch sensor
        + Triggers vacuum to deflate
* **Facial Recognition** 
  + “Austin, Who is that?” (Speech to text)
  + Raspberry Pi sends simple serial command string to camera hardware
  + Facial recognition
    - Recognized?
      * Yes?
        + Sends name of person as string (text to speech)
      * No?
        + Sends serial string “I do not recognize anyone here”
* **Emotion Detection**
  + “Austin, read emotion” (Speech to text)
  + Raspberry Pi sends simple serial command string to camera hardware
  + Emotion detection