DAME Group Progress Report
EE Senior Design
3/21/2025

Motion

- Ordered two separate linear actuators to test for lifting and lowering the body/arm piece
- Awaiting their arrival to test
- Designed new frame
    - Fixing size issue to allow screen to fit
    - More holes in between arms and body to allow for wires to feed through seamlessly
- Next Steps:
    - Test Actuators, confirm motion is as desired.
    - Once new frame is printed: assemble and test motion on frame

AI/UI

- Investigated issue with OpenAI not understanding speech:
    - Confirmed microphone data is being properly streamed to local server
    - Improved audio processing on local server, however response performance is still inconsistent
    - Next steps: test fool proof .wav file with API to determine whether or not the issue is with the local audio processing. If API's performance is still inconsistent, adjust architecture by breaking up tasks (STT→Chat Response→TTS) instead of using speech to speech model (current implementation).
- Further looked into display methods and integration with the AI API
    - Added a power and time display
    - Make sure that there is enough power to encode the monitor
    - Once the AI is properly implemented, connect the serial monitor to the screen for real time display

Power

- Purchased diodes for motors and the two Li-Ion batteries

PCB

- Still working on PCB schematic
    - Currently completed on the schematic:
        - Voltage Regulator
        - Restart Button
        - Boot Button
        - USB-C Connector
    - Downloaded/imported KiCad symbol/footprint for the DC-DC converter
    - Next Steps on schematic:
        - Finish Audio Amp/Speaker: add screw terminal connector and ferrites/capacitors to output terminals (need to decide values of capacitors and ferrites)

        - Microphone: Pick 5-pin connector (JST?) to breakout board
        - Add SPI Interface (Nextion display) 4-pin connector
        - TLVM13630 DC-DC converter connections/passives
        - Pick and add connector for battery connection to board/DC-DC converter
        - Add diodes and pick connectors for servo motors
        - UART?
        - Header pins/anything else for debugging
- Start Board Layout once schematic is complete
- Purchase any components we add to the board that aren't stock