

## P17665 Rotating Dynamometer

### Mid-Phase Progress Report

Unfortunately our team ran into a fairly large issue with the deflection as shown in the last meeting, but we have taken the discussed steps to minimize the issue. The change in radii (as shown in models on Detailed Design Page) have significantly decreased our deflection and we are now in the acceptable range. This was done per the recommendations from Dr. Liu and certainly prevented a fatal design. The outline below describes the progress on each step of our deliverables and a specified date for when they will be completed. The progress as of 12/6/16 can be seen at the link below.

<http://edge.rit.edu/edge/P17665/public/Detailed%20Design>

- **Mechanical Analysis**

- Spreadsheet calculations (Zac/Elbert): 100%
- ANSYS Simulation and Modeling (Elbert/Brian/Zac): 100%
  - This has been worked on to decrease the overall deflection from 0.035 in to 0.012 in. We believe that the changes in radii from the simulations on our Detailed Design Page compared to our Preliminary Design Page were the main driving factors in decreasing the total deflection.
- CAD Models (Elbert/Brian/Zac): 100%
  - Tool-Holder Adapter and Acceptor (Elbert): 100%
  - Measurement Structure (Brian): 100%
  - Full Assembly (Elbert): 100%
  - Housing Structure (Brian): 100%
- Drawings and Prints (Elbert/Brian): 90%
  - Elbert to interface with Gary on must have's for the prints, done by 11/29/16

- **Electrical Analysis**

- High Level Overview (Muhammad): 100%
- Wheatstone Layout (Muhammad): 100%
- Amplifier Circuit (Muhammad/Joe): 100%
  - Simulation uploaded to EDGE page, shows output after amplification. Voltage is between 0.3V-3.0V so no need for a regulator.
- Filtering Circuit (All): 0%\*
  - This is to be done digitally in LabView during MSD II. We do not know the specific frequencies to throw away so experimentation needs to be done in order define the frequency range of capture.
- Program Code (Muhammad): 100%
  - Able to receive no packet loss of data during testing, Bluetooth transmission is working.
- Wiring Diagram (Muhammad): 100%
- Power Consumption (Joe): 100%
- Mounting Electronics (All): 100%
  - Housing for all electronics around device has been uploaded with spots/notes for each electrical location.

- **Project Management**

- **Bill of Materials (Joe): 90%**

- **Revamping to show electrical and mechanical sub-assemblies, done by gate review.**

- **Test Plans (Brian): 90%**

- **Need to cover two more requirements under our testing. Under review of plans because of deflection speed bump before thanksgiving break, done by 11/29/16**

- **Project Plan for MSD II (Joe): 90%**

- **Completed in Excel like MSD I Project plan – need to move over to Microsoft Project and have a live action list for MSD II, done by gate review.**

- **Risk Assessment (Elbert/Muhammad): 100%**

- **Risk Assessment has been completely updated with critical dates and risk graph.**