Biweekly Meeting 04

For the Project of:
Multi-Objective Parameterized Model for Aircraft Electrical Propulsion System

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1. **Previous Meeting items**
    - **a.** Enrich the web page based on model input/outputs [design plan]
    - **b.** Set up a PostgreSQL server locally and test the input by some placeholders by adding the input data in a database.
    - **c.** Connect the web with a Database.
    - **d.** Define what constitutes an input into the model. *[Pushed to future plans]*
    - **e.** Actually construct the model 1 in code
        i. To this end, a better understanding of the desired outputs is key
    - **f.** Work on git and github to upload and push the codes from backend and frontend.
    - **g.** GUI design Hi-Fidelity
        i. Color implementation
        ii. Visual components (button, tabs, etc)
        iii. Possible inputs
        iv. Integrate additional user variables input into model outcomes.
            1. Altitude
            2. Coolant
            3. Efficiency drops
        v. GUI design Hi-Fidelity
            1. Make adjustments based on suggestions
            2. Implement into the website

vi. Add more operations like create, read, update and delete (CRUD) related to the database in the backend (Flask app) and view the tables and data from CRUD in the user interface pgAdmin from PostgreSQL.

vii. Maintain two connections in the frontend and backend, one is about connecting the Flask app with PostgreSQL, and another is connecting Python with PostgreSQL.

viii. Connect the database with the backend with the model part.

2. Future Plans

i. PROJECT PIVOT

1. RTCA DO-160G
    a. Environmental Conditions and Test Procedures for Airborne Equipment
2. "**RTCA DO-160G** provides standard procedures and environmental test criteria for testing airborne equipment for the entire spectrum of aircraft from light general aviation aircraft and helicopters through the "jumbo jets" and SST categories of aircraft." - RTCA
3. **Note**: The current "User Guide material from DO-160G" **has been changed** and now the guide has been replaced by the **DO-357**. We remind you that now the DO-160G text **can not be read without** the DO-357 one. The new DO-357 User Guide: Supplement to DO-160G provides an update of the User Guide material for these same Sections and provide new User Guide material for Sections 4, 5, 7, 8, 10, 11, 15, 16, 17, 18 and 23."

ii. Run this idea via professor. <>

iii. Possible pivot to just modeling the inverter

iv. Adjust database design based on the project scope, mainly about sections from DO-160G

3. Overall Project Concepts

a. Maintain HMI/frontend backend
b. Pivot to taking inputs of data and running tests to validate or invalidate data against the RTCA DO-160G standards.

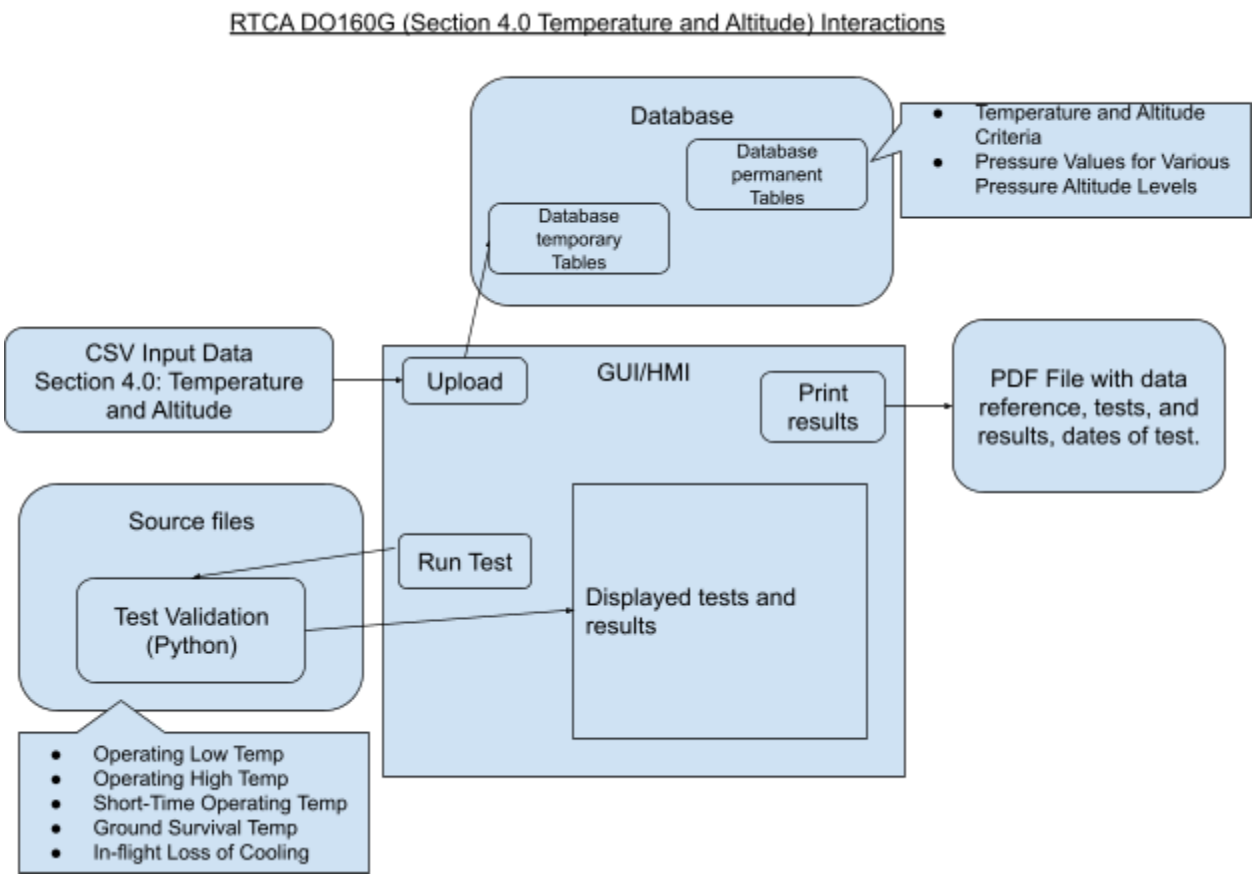
4. Problem Items

a. **Requires initial investigation into** RTCA 160G what it entails.
b. Data incoming early next week on sample data for
c. A correct URI address about PostgreSQL should be provided when connecting to the Flask App.
d.
e. “Model one” style
f. We met with the faculty mentor (Baosen Zhang) and he informed us that the task as described by ourselves and the company is not achievable with the time given and our level of experience. It seems that there may be a miscommunication between what the company wants and how the task was communicated to us, or how we communicated to Dr. Zhang.

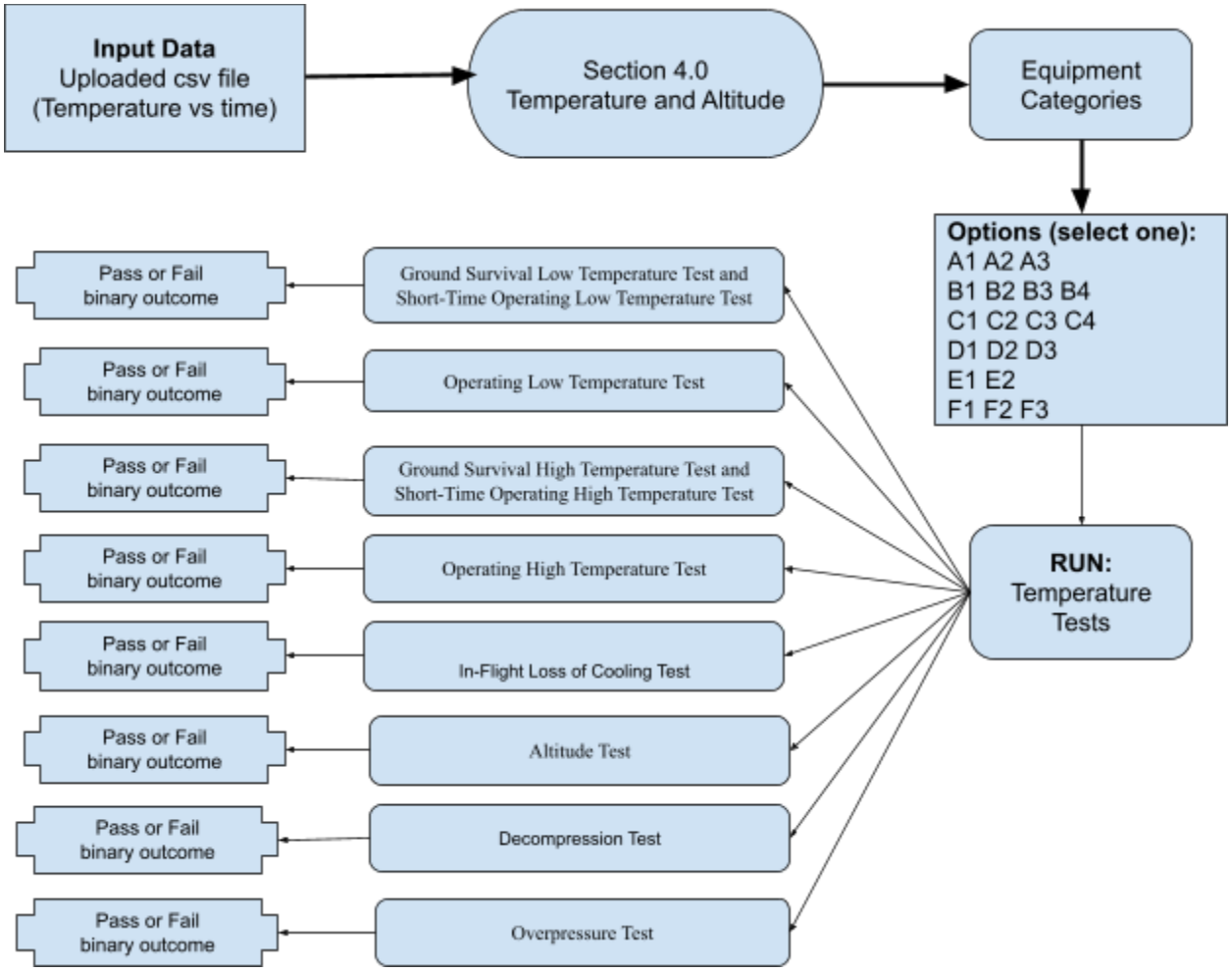
g. Dr.Zhang recommended focusing on a single component of the powertrain, chiefly the fuel cell since that is the critical component for ZeroAvia's purposes. Other components such as an inverter or motor should have well known properties and efficiencies.
h. Also for doing the modeling and optimizing it we require datasheets related to the powertrain components as well as some prior testing data of a few months for deducing the model requirements. These documents are still pending from ZeroAvia's side.
    i. The faculty mentor said that data collected during test flights would be useful.

5. Budget and Requests

a. Possible unknown cost of RTCA DO-160G (and maybe subsequent documents) TBD. DO-357 ?



Above is the updated vision to take into consideration the RTCA DO160G document. We have the same fundamental relationships. But instead of the source files performing modeling + MDO we have test validation of the RTCA DO160G requirements.



Above is an outline of the information flow for RTCA DO160G particularly for the first section temperature and altitude.