Lockheed Martin Space - Digital Twin Project Requirements

Created by University of Colorado at Boulder Capstone Team

Functional:

Requirement	Category	Description	Estimated Completion	Assumptions
Improve existing Tb&S heat model analyzer	Tb&S	Improve the performance and analytical capability of the Tb&S Model analyser.	February 12th, 2021	● An existing Model analyzer has been developed by the Tb&S Team. ● Will meet with the product owner to enumerate where the software is currently lacking. ● Will implement the enumerated improvements under the guidance of the product owner.
Integrate non-Tb&S heat model analysis	non-Tb&S	Create an application that reads in and reports the I/O of the Thermal Desktop Model to create an endpoint for translating the two.	March 12th, 2021	● Will work with the non-Tb&S point of contact, Dave Hansen, to analyse how our application will interface with the Thermal Desktop Model. ● Will tailor our application specifically to the Thermal Desktop Model. ● In the future our application will need to be generic enough to handle other non-Tb&S models so lay groundwork.
Automate translation of I/O between thermal models	Tb&S and non-Tb&S	Automate translation of I/O between the two thermal models in order to remove the need for the Tb&S	April 16th, 2021	● Will need to convert the data to the same format and units. ● The program has to be able to recognize the

		team to translate the models by hand, and to work towards creating a general model to translate future subsystems.		different parameters and types, and be able to convert them to other models.
Explore generalization of translation tool	non-Tb&S to Tb&S	Look into automating other non-Tb&S to Tb&S model translations, such as for power supply models.	April 30th, 2021 (If time allows)	• There are many subsystems in the Digital Twin project that will need a similar application translating between models.
Improve translation tool user interaction	UI/UX	Improve the command line interaction with the translation tool.	April 30th, 2021	• Currently, the command line input is not intuitive and requires the user to be familiar with the tool. • Will incorporate the use of config files to simplify user interaction. Ideally the tool will execute after a simple command. • Documentation for configurable aspects of the tool will be provided.
Provide documentation for finished product	Support and Document ation	Create a document describing how the final product runs, individual explanations for given functions, along with well-commented source code.	April 30th, 2021	• After our project is complete the team at LM will still need to reference our program. • Documentation will be very similar to the format of Gitlab wikis for existing code in the project.

Non-functional:

Objective	Description
Interfacing	Our application should be able to be used within the larger Digital Twin program
Performance	Our application should work in real time
Security	Keep all Lockheed Martin information private
Supportable	Should be able to accept other models and translate between them
Documentation	Leave documentation so sponsor understands details of application
Reliability	Have the application work as intended no matter the outside cumstances

** more detailed technical requirements will be developed early next semester as we learn more about the existing solution we're modifying

Change Control Process

1. Sponsor notifies all LM contacts and CU team of the need for new or changed requirements and why.
2. CU team meets to review changes within 2 days of notification, responds with suggestions or acceptance of new requirements by a vote of 5 out of 7.
3. If the vote fails, notify the sponsor with reason that the requirement change is not doable.
4. If the vote succeeds, CU team receives acknowledgement and publishes new requirements document in repository.