Fall 2020 ME751 Final Project Report

University of Wisconsin-Madison

SimEngine3D Development

Logan Rapp

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**Abstract**

This report describes the progress on the development of a python code - SimEngine 3D – that is used to simulate multibody dynamic problems.

<https://github.com/lrapp/simEngine3D>

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# General information

* Home Department: Mechanical Engineering – Solar Energy Lab
* Current Status: PhD student
* Individuals working on the Final Project: Logan Rapp
* I am not interested in releasing my code as open source code.

# Problem statement

I will continue development of my simEngine3D code to include support for all joints and driving constraints discussed in class and an improved method of providing model definition. My research is not closely aligned with topics covered in this course, so I was not able tie this final project with my research.

Explain in clear terms what you wanted to accomplish. If you go w/ a default project, simply indicate so. Please use here the material that you provided in your Final Project proposal.

As part of this section, touch on the motivation/rationale for your project selection. Explain why you chose to work on this project. For instance, if it’s work related, explain in rough terms what the big process is, and what part you’re trying to take care of.

# Solution description

Indicate how you went about implementing your solution. Explain data structures, algorithms used, code structure, function you implemented, etc. Provide a panoramic snapshot of your Final Project effort.

I used a custom python class definition to hold all the components of the problem and the results. I made use of a Pandas DataFrame structure to hold portions of my results as well.

# Overview of results. Demonstration of your project

Explain here what you obtained, explained why the results are good/bad. This is the place where you talk about the outcomes of your Final Project effort. It is not the end of the world if your code doesn’t work as anticipated. Explain here how far you have made it.

Most often, you have a comparison against sequential code, perhaps via a scaling analysis. Make sure you include plots and/or tables to show your results.

# Deliverables:

Discuss what is delivered for this Final Project. Important points:

* This report should be in Canvas.
  + On multi-student teams, each team member should submit a final report even if the reports end up identical. However, the code should be in one repo
* Tell us what is in your git repo and explain how we can run your code
  + If we cannot run your code, explain why that is the case

# Conclusions and Future Work

# References

[1] Make sure to give credit where it’s due.