

Class Project Directions

The overall goal of this project is to design a virtual working tractor, using MATLAB SIMULINK software. Each group will have responsibility to design and simulate one “component” of the tractor. These components will then be linked together to simulate the complete operation of the tractor pulling an implement through the soil.

Each group will have complete control of the approach they take to designing and “building” their individual parts of the system. However, each group must provide the necessary “outputs” that are required from by other groups in the project and must interact with the other groups to ensure the “inputs” necessary for their approach are available. Therefore, the design approaches must consider the approach of other groups to ensure that they are compatible. This makes interaction between different groups as important as good “teamwork” and delegation of responsibility within the group.

This project will require many assumptions and simplifications in the development of each model. Although this is expected, each group must justify the decisions they make. These justifications could range from; a “complex component” would not substantially increase the “quality” of the overall system and therefore is not justified, to the fact that the resources (in your case time, which in industry relates to money) are not available to develop a more complex system even if there are significant improvement in the product. There is no right/wrong “design,” just good and bad justifications for the simplifications and assumptions made. Of course, oversimplification of your groups project until very little work is required, will be reflected in the grade.

Final Report Due: April 27th, 2007

Expectations

a). Interaction between groups via e-mail. Copy of e-mail forwarded to instructor (sbirrell@iastate.edu). Groups must respond within 2 days. Response could be negative or positive.

b). Final Report will be a formal report and must include the following (although not necessarily under these headings)

Introduction (Brief Introduction to the project goals and criteria)

Literature Review. (A review of the history and state of the art related to your particular project. You must clearly show that you understand the background, issues and theory for your part of the project.)

Approach to Problem. (The approach and theory used to implement your model)

Alternative approaches. (Other methods that may also be applicable)

Justification of your approach and potential weaknesses to your approach. (Justify your approach and any assumptions or simplification you made. The justification may be more important than the decisions you made)

Main Body of your report (Description of your model and how each sub-section operates.)

Results, Discussion & conclusions. (Results and proof that you tested your model.)

Comments on the value of this project on learning and how it may be improved. Any other comments.

Grade Matrix:

| | |
|-------------------------------|--------------|
| Model Complexity and Accuracy | 30% of total |
| Introduction and Lit review | 15% of Total |
| Approach & Principles | 30% of total |
| Report_Quality | 25% of total |

Evaluation of interaction within groups and between groups:

Within Group Evaluation:

Not Applicable: VG G Acceptable Fair Poor

Contribution of Member
Meeting of Deadlines
Group Cohesion

Between Group Evaluation:

Not Applicable: VG G Acceptable Fair Poor

Contribution to "Total Project"
Speed of Response
Quality of Response
Cooperation with groups

Other Comments: