Assignment A4 – Tradespace Exploration and Concept Selection

Summary

In this fourth assignment you explore the design space for your system for the 2016 Cansat competition and downselect to a single concept. Build on the work you did in A3. This will provide the basis for developing in more detail a particular concept for the PDR in Assignment A5.

This assignment is worth 1/8 (12.5%) of your final grade. The final deliverable must be uploaded as a single PDF file with the name: *A4_Team#_2015.pdf*.

In addition to your team number and name, all team members who contributed must be clearly identified by name and email address on the first page of your submission.

1. Pugh Matrix [30 points]
Create a Pugh Matrix to score the concepts you generated in A3 through concept brainstorming. The criteria you apply to score the alternative concepts should be mapped to your requirements set from A2. After doing the Pugh Matrix process once, consider rejecting your most inferior concepts and repeat the process by adding some hybridized concepts that combine some of the best features of your best concepts (however a single pass through the Pugh Matrix is perfectly fine). Document your Pugh Matrix and comment on its conclusions.

2. Multi-Attribute Utility Analysis [40 points]
Use Multi-attribute Utility Theory to evaluate and score the designs you generated through architecture enumeration in A3. The utility of an individual architecture should be closely correlated to the score you would expect that the architecture could generate in the Cansat 2016 competition, but also the amount of effort it would take to build and complete the design (cost in terms of labor time or effort and money). You could also include your assessment of the level of risk. Given the amount of time available to complete this assignment the models you use will have to be simple. Document your Multi-Attribute Utility analysis and conclusions.

3. <u>Final Concept Selection [30 points]</u>
Choose a final concept (system architecture) for your team's entry in the 2016 Cansat competition. Explain the concept in a single paragraph of about 200-300 words and show it using a simple sketch and high-level OPD. Explain whether this concept was generated by brainstorming, by architecture enumeration or both (or in another way). Please keep in mind that this concept will be the basis for your preliminary design in Assignment A5, so limiting complexity will be essential.

<u>Grading Rubric and Time Commitment</u>

1. Pugh Matrix	max 30 Points
2. Multi-Attribute Utility Analysis	max 40 Points
3. Final Concept Selection	max 30 Points
Total	max 100 Points

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