Proposal Report – 13 Pages MAX

- Title page / Executive Summary (1)
- Table of Contents(1)
- Introduction (1)
- Body (8)
  - Problem Definition (RCGs)
  - 3+ Proposed Solutions
  - Comparison
- Conclusion (1)
- Ref / Bib (1)
- Total = 13 pages

- Appendix (unlimited)

Title Page

- Name of Project
- Names of Authors & Affiliation
- Executive Summary (bottom half of page)
  - Short description of **EVERYTHING** contained in report
  - Most difficult piece to write

- May be creative (if you want)
- No figure titles (only decoration)

Typical Executive Summary

Parks Canada has retained KAM-CO to design a system to protect hikers and the infrastructure of the West Coast Trail. KAM-CO has designed and built a scale system to accomplish this goal. From a number of proposed designs the most promising was chosen and developed into a prototype. The prototype proved to be an accurate, durable, esthetically pleasing and inexpensive product. The final design further improves upon the prototype and will provide Parks Canada with the best possible solution to protect hikers and the infrastructure of the West Coast Trail.

Good Executive Summary

A device is designed that determines if two hikers can safely use the river crossing trams of the West Coast Trail. The device must be safe to use, inexpensive, weather resistant, low maintenance, and light enough to deliver to remote locations by foot.

Three designs are considered, two of which are load cells designs while a third consists of a swing hanging from a rope. All three candidates use a strain gauge to measure weight. A load cell design is chosen to maximum safety and robustness with a user interface that consists of three indicator lamps to indicate the safety level.

A parallelogram shaped load cell with a single strain gauge is shown to be insensitive to load placement. A circuit consisting of a balanced bridge, instrument amplifier and comparator is designed to control the visual interface and the truss dimensions are optimized to trade off function with ease of transportation (size and weight).

A prototype is constructed for less than $50 CAD. System tests demonstrate a delayed response when the applied load exceeds 100 lbs and plastic deformation when it exceeds 1000 lbs. It is suggested that accuracy could be improved by lower friction joints and a temperature compensated monitoring circuit.

Table of Contents

- Table of Contents
  - Headings
  - Sub-Headings
- List of Illustrations
  - List of tables
  - List of figures
  - Include illustrations in Appendix
    - No page numbers
    - List by item number (A.2, A.5, etc.)

Introduction

- Answers the question:
  - What is your STARTING POINT?
- Brief description of problem
  - As described by client
  - Do not plagiarize
- Overview of RCGs
  - Major subcomponents
  - Time & money constraints
  - Resources available

Body

- 12 point type
- 1 ½ spacing

- RCGs
  - Rank Goals in order of importance

- 3 Proposals
  - Brief Description
  - Major Subcomponents
  - Sketch / Block Diagram / Flowchart

- Comparison WRT RCGs

Example Requirement Spec

This is a software development project in which a team will be required to develop a user interface enabling the user to remotely access the grinding machine as described above. Based on specific security level clearance users will be able to either monitor only or execute task on the machine through the remote interface. Email alerts will need to be integrated into the environment. We are looking for the machine to be able to also communicate to the users through the interface. These alerts will be delivered to the user to notify them of changing machine conditions such as: Machine breakdown, Machine requirements for consumable materials such as coolant, oil, or tooling, Machine run times, etc.

Depending on project timeline an additional feature may be the integration of Direct Video link with the machine.

Conclusion

- Brief overview of designs being considered
- Brief overview of design comparison
  - What made the winning proposal stand out?
- Identification of proposed solution
- Brief description of next steps

- Conclusion should stand on its own
- People might read Conclusion without reading Body

References / Bibliography

- References
  - Specific information referenced in report
  - IEEE format
  - [1] L.J. Stocco, S.E. Salcudean, F. Sassani, “Optimal Kinematic Design of a Haptic Pen”, IEEE/ASME Transaction on Mechatronics, Vol. 6, No. 3, pp. 210-220, September 2001.

- Bibliography
  - General information which may or may not be directly referenced in body of report
  - [2] R.C. Dorf, R.C. Bishop, “Modern Control Systems”, 11th ed., Pearson / Prentice Hall, 2008.

Appendix

- Body
  - Anything required to understand report
  - Graphed data
  - Flowchart or Pseudo-code

- Appendix
  - Information you did not produce (data sheet **excerpts**)
  - Pictures > ½ page
  - Raw data (shown as graph in body)
  - Detailed circuit diagrams
  - Assembly / C++ code

Appendix

- Label items specifically
  - The “Pinch” function (see assembly code in the Appendix) is responsible for actuating the servo motor.

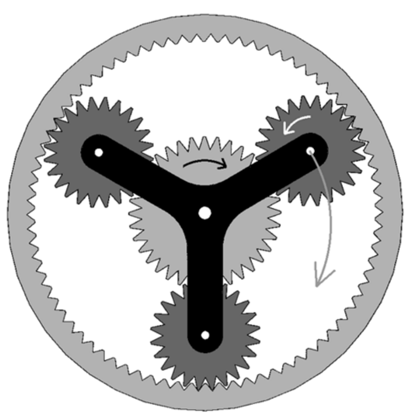
  - The “Pinch” function (see Appendix A.2) is responsible for actuating the servo motor.

Efficiency

- Verbiage with useless or no substance
  - After many group discussions where we compared a large number of possible alternatives, we determined that the best solution involved a servo-motor and cam shaft. A cam mounted on a servo-motor …
  - After comparing the 3 alternatives shown in Appendix A2-A4, a cam mounted on a servo-motor was found to be the best solution due to …

Figures

In the figure of a planetary gear system shown below, clockwise rotation of the sun gear in the centre of the figure, causes counter-clockwise rotation of the three planet gears which are adjacent to the sun gear. The planet gears travel along the interior of the orbit gear, which is the largest gear in the figure, and rotate the y-shaped carrier that they are attached to in the same direction but at a slower rate than the sun gear.



Figures

In Figure 1, clockwise rotation of sun gear (a) causes counter-clockwise rotation of planet gears (b) which travel along orbit gear (c) to rotate carrier (d) in the same direction but at a reduced rate, as the sun.

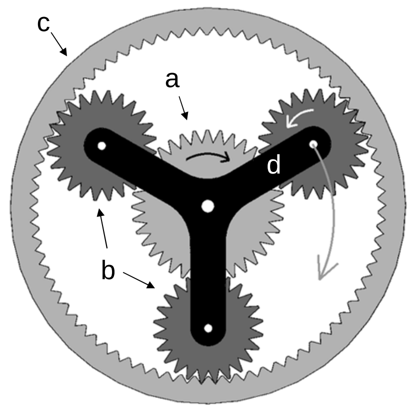


Figure 1: Planetary Gear System

Figures

- Always appear BELOW the point where they are first referred to
- May appear in Appendix (> ½ page)
- May not appear on the Title Page
- Always have a figure title if they are not decoration
- Are always referred to in the text (if they have a figure title)

Equations

- Always appear BELOW the point where they are first referred to.
- Are each assigned a number in round brackets (1) in the order that they appear.
- Have all of their variables defined in the text.

The most common form of Ohm's Law (1) relates a relative voltage (V) to an absolute current (I) through an impedance (Z). Replacing V with the node voltages, V_1 and V_2 (2), resolves the ambiguity concerning the reference point.

$$V = IZ \qquad (1)$$

$$V_1 - V_2 = IZ \qquad (2)$$

Introduce Everything

- Beware the word "the".
- **The** voltage regulator used in **the** power supply is an LM7805.
- A power supply is designed which must provide 5V DC and a maximum of 1 Amp. It consists of an oscillator circuit, a full bridge rectifier and a voltage regulator. The voltage regulator used in the power supply is an LM7805.

Introduce Everything

- Rule of thumb
  - “The” refers to a PARTICULAR object. You must define an object before you may refer to it as “the xxx”.
  - Just like the word “it”.
  - “A” refers to ANY EXAMPLE of an object.

Mixed Narrative / Tense

- In this project, Team Ivy League designed a capacitive IV drip sensor. First, you construct a drip tube pinch-off mechanism, and then I added a resonant circuit.
- A capacitive IV drip sensor is designed. It includes a drip tube pinch-off mechanism and a resonant circuit.