Report Outline

1 Abstract

1. A mechanical switch involving a spring can have many uses.
2. Depending on the desired use of the spring, an optimal spring will be different.
3. To find an optimal spring we need to have a set of constraints and objectives to optimize.
4. The constraints and objectives are subject to change depending on the use.
5. The objective of this project is to design a flexible optimization routine, that is, flexible in what constraints and objectives are considered.

2 Introduction

1. To be flexible in finding an optimum spring you must allow for constraints and objectives to be interchangeable.
2. There also exists constraints and objectives that are informed by real-world tolerances for design and fabrication.
3. In order to allow this flexibility we employ the use of object oriented programming techniques.
4. In addition, we must be able to find an optimal spring that is subject to constraints, and tolerances that are set by
5.

3 Helical Compression Springs

1. A helical compression spring has many attributes that are associated to it.
2. There are material attributes
3. Work done on the design given uncertainty in an acceleration switch, IMECE2011 paper.
4.

4 Problem Formulation

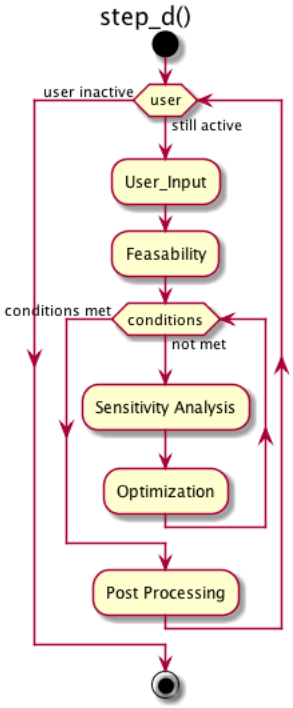
1. The formulation is informed by many sources...
2. Multiple-Interconnected Dimensions, graph of interconnectedness
3. List the properties and a short description.
4. Illustrate example of optimization, and explain our generalization.
5. Relaxation and Creep

5 Approach to Problem

5.1 Software Design

1. Flexibility integrated into existing optimization.
2. Constraint vs. Objective
3.
4.
5.

6 Workflow



6.1 Feasibility

1.

6.2 Sensitivity Analysis

1.

6.3 Optimization

1.

7 Computational Experiments

1. Case Studies
2. Relaxation and Creep

8 Summary and Future Work

1. Computational Inefficiencies
2.
3.
4.
5.

9 References