Multi-Objective Knapsack Problem

Genetic Algorithms and Wisdom of Crowds

Sarah Mullins

Speed School of Engineering

University of Louisville

Louisville, USA

skmull02@louisville.edu

Ashley Revlett

Speed School of Engineering

University of Louisville

Louisville, USA

anrevl01@louisville.edu

**Abstract – The purpose of this project was to explore the application of genetic algorithms and wisdom of crowds to the multi-objective knapsack problem. This is a variation of the classic NP-complete knapsack problem, in which the contents of a container should have maximum value without outweighing the capacity of the container. A multi-objective version of this problem involving the maximization and minimization of given values was explored. Large values for the number of objects and knapsack capacity quickly increase the computational complexity of the problem, making brute-force techniques intractable. Instead, genetic algorithms were combined with the wisdom of crowds to attempt to find optimal solutions. The genetic algorithm performed converged relatively quickly toward near-optimal values, but often got stuck in local optimal solutions. Applying the wisdom of crowds approach to the results did not necessarily yield improved solutions.**

**Introduction**

**Prior work (Literature Review)**

**Proposed Approach**

**Experimental Results**

**Data**

**Results**

**Conclusions**

**Acknowledgements**

**References**