1145-90-1844   **Yun Lu*** (`lu@kutztown.edu`), Kutztown, PA 19530, and **Francis Vasko** and **Charles Saternos**.
A Population-based Metaheuristic Approach for Solving the Multi-demand Multidimensional Knapsack Problem. Preliminary report.

The Multi-Demand Multidimensional Knapsack Problem (MDMKP) is a combinatorial optimization problem with real-world applications that is extremely difficult to solve due to conflicting constraints. In this study, we adapt a population-based (a collection of solutions) metaheuristic to efficiently generate near-optimal solutions to the MDMKP. This metaheuristic, called Jaya (victory in Sanskrit) was introduced in 2016 by Rao to solve continuous nonlinear engineering design problems. Since the MDMKP is a binary optimization problem (variables are bit strings, not continuous variables), we made modifications to the Jaya metaheuristic in order to effectively solve the MDMKP. For test purposes, we use 810 large MDMKP instances available to researchers on the web. In this talk, we will report empirical results we obtained from solving these 810 MDMKP instances using our new Jaya-based metaheuristic approach. Our results will be compared to the optimal (if known) or best known results for these problems. (Received September 25, 2018)