1 Talk at the Summer School on Operations Research and Application

Title: **Vector Optimization: basic concepts and numerical methods**

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Abstract. A large number of real problems can be presented as an optimization model. However, many of them requires simultaneous solution of several objective functions and lead to so-called vector optimization problems, that is problems with vector-valued objective functions. This kind of model is particularly important in the theory of decision making when the decision maker must take into account a number of criteria in his decision process, which are sometimes conflicting with each other. The aim of this talk is to present basic concepts of optimality for vector problems including partial orders in a linear space, Pareto efficient solutions and domination property. Then we provide existence criteria for efficient solutions and some numerical methods for solving vector problems. Emphasis will be made on mathematical backgrounds of the theory of vector optimization and practical problems that require vector optimization formulation.

2 Talk at The 3rd International Conference on Network Analysis, May 20-22, 2013

Title: **Multi-product supply demand networks with elementary flows**

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Abstract. In this talk we present a multi-product multi-criteria supply demand network with capacity constraints. We analyze different concepts of equilibrium and establish some relationships between them. Particular attention is paid on elementary flows and on the construction of variational inequalities which are equivalent to network equilibrium problems. A discussion on numerical methods for finding equilibrium flows is also given.