Research School for Operations
Management and Logistics

Multi-objective optimization using Gaussian Processes: including user preferences

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This PhD dissertation focuses on the field of stochastic multi-objective optimization. Previous research in our group (Sebastian Rojas-Gonzalez, defense expected May 2020) has shown the power of Gaussian Processes (GPs) for multi-objective optimization in settings with stochastic outcomes (such as, e.g., objectives that are measured through stochastic simulation). The PhD research of Sasan will focus on including the decision maker's preferences in the search for Pareto-optimal solutions, as well as in the identification of the points among which he is indifferent. As such, this PhD dissertation is on the interface of optimization and machine learning; our hypothesis is that the use of GPs can be helpful to focus the search on the area of the Pareto front that is most relevant for the user, by saving (expensive) computer simulation time.