

**Title of the proposal:** Multi-objective optimization using surrogate models

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**Host laboratory :** CRISTAL-CNRS and INRIA

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**Topic :** Optimization, Meda-modeling,

**Keywords :** Metaheuristics, Multi-objective evolutionary algorithms, Surrogate models

**Description:**

Many real-life optimization problems are characterized by expensive evaluations functions. A surrogate model is an approximation of a simulation used to construct simpler and lower computational cost models. Among the techniques to create surrogate models, we have rational functions, radial basis functions, Kriging models, support vector machines, polynomial, regression, and splines.

Surrogate models have been incorporated in multi-objective optimization to reduce the number of required evaluations in solving the problem. Most of the work in the literature is concerned by continuous optimization problems.

The objective of this project is to adapt well-known surrogate models to combinatorial multi-objective optimization problems and their incorporation into evolutionary algorithms. The target application is related to scheduling such as flow-shop scheduling.

**Host laboratory or academic department :** INRIA Research center, CRISTAL(Research Center in Computer Science, Signal and Automatic Control of Lille)-CNRS Laboratory : <http://cristal.univ-lille.fr/?lang=en>

**Level of studies :**

Bachelor's level (undergraduate)

Master's level (postgraduate)

**Duration :** from 3 to 6 months

**Type of evaluation**

Written report and oral defense

No funding available from the laboratory