

# DM63 - Heuristics for Combinatorial Optimization Problems – Lecture Notes

Lecture 9, Fall 2006

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## Lecture October 23

We described the cyclic exchange method from the very large scale neighborhoods scheme. An application example has been given on the Vehicle Routing Problem and on the Graph Coloring Problem.

The Lecture then focused on Genetic Algorithms for optimization.

The next Lecture will be dedicated to Ant Colony Optimization.

Task 3 is going on and the deadline for submissions is Wednesday 25.

Lectures will terminate on the 6th or 9th November. The exam project will be launched around the 6th of November.

To receive a good evaluation the project must contain:

- the implementation of at least one construction heuristic, one local search and one metaheuristic for the problem posed. In other terms, there may be more focus on one of these three parts but all of them must be developed.
- worst case analysis (mainly of complexity nature) for the procedures that allow it.
- empirical testing of the algorithms developed. Computational experiments may be used for configuring and tuning, for comparing different algorithms and for predicting their behavior. An appropriate description and presentation of results is required.
- competitive results.

The report must be around ten pages long (and by no way it must exceed 15 pages). It must exhibit a logical structure and clearly describe the methods developed together with the empirical results.

Details on the project will be posted on the Course Web Site under the section Exam Project:

<http://www.imada.sdu.dk/marco/DM63/Evaluation/project.html>

## Bibliographical Notes

Genetic Algorithms are described in the article 7 of the Course Notes.

A paper on the No Free Lunch Theorem is

D. H. Wolpert and W. G. Macready, No free lunch theorems for optimization, IEEE Trans. Evol. Comput., vol. 1, pp. 67-83, 1997.