Case-Study HFT-Stuttgart: Master Software-Technology – summer term 2010

**Heuristic of an Evolutionary Algorithm to solve the curriculum based course timetabling problem**

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**Idea of the heuristic:**

**Generator:**

Fills up the solution table with feasible solutions generated by the algorithm of Martin Josef Geiger[[1]](#footnote-2).

**Solution table**

Concrete Solution

Vote

Solution 1

100

Solution 2

10

…

Solution n

20

Rates

**Evaluator**

Fills up

**Generator**

Writes back

Reads

**“Genetist”**

The generator also brings in new genes into the population during the evolution-process.

**Evaluator:**

Evaluates each solution by one concrete curriculum. Based on this rating the reproduction-strategy will take place. The higher the rating is, the higher is the possibility for reproduction of the concrete solution.

**“Genetist”:**

This module reads several solutions from the solution table and creates new (mostly better) solutions via

* Recombination
* Mutation

This module uses the Neighborhood Analysis by Zhipeng Lü, Jin-Kao Hao and Fred Glover[[2]](#footnote-3).

**Activity Diagram:**

Adequate solution found

Genetist: Read m solutions based on their ratings.

Genetist: Recombination & Mutation.

Genetist: Eliminate the worst k solutions.

Find a “good” solution

Generator: Fill up the solution table until n feasible solutions.

Evaluator: Give a rating for every solution.

**Measurements:**

1. <http://w1.cirrelt.ca/~patat2008/PATAT_7_PROCEEDINGS/Papers/Geiger-TC1d.pdf> [↑](#footnote-ref-2)
2. <http://www.info.univ-angers.fr/pub/hao/papers/JoH2010.pdf> [↑](#footnote-ref-3)