

(Year of 2005-2006)

Possible Topics of Diploma Thesis for Undergraduates

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The topic of this year.

The main topic of this year is datamining, that is, knowledge extraction from data. Data is not a knowledge, but just data. Given a huge amount of data, we usually need to extract a set of knowledge, like doctors given a medical database.

We, first of all, choose one data-set from various kinds of different database in public domain. Then we propose one technique — proposing a totally original new technique, or improving an already proposed technique.

Two other alternative topics are also possible to be selected. One is “*An Optimization of City Traffic System*,” and the other is 2-D Jeep problem which is a continuation from the last year’s topic.

Three candidate topics

(1) Data Mining with a Soft-computation Technique.

- ★ An approach to Data Mining using a so-called Soft-computation such as Evolutionary-Computation, Fuzzy-Rule, Neural-Networks, Artificial-Immune-System, Ant-Colony-Optimization or other Biologically-inspired-algorithm. As examples
 - Medical Database by Evolutionary Fuzzy-logic.
 - Financial Database by Artificial-Immune-System.
 - Iris Flower Database by Ant-Colony-Optimization.

(2) Optimization of a City Traffic System.

- ★ Using an Evolutionary Computation, we try to optimize a city traffic system. To be more specific we optimize a timing of traffic signal with a scale ranging from two cross-road to the one in the big city like Paris.

(3) A Jeep in a Desert Problem

- ★ This is a 2-D version of already known but still open issue called *Jeep Problem*.
 - One possible approach by growing Finite State Machine.