Term Project

It will count 20% of the final grade.

When you select a topic, discuss it with me.

Turn in your intermediate progress report of the project.

Turn in your final report with all references.

Report format: **ppt** and **pdf** formats as the lecture notes to be uploaded in the class homepage. Include your key words in the file name (i.e., [1]Network Competition.pdf)

Refer the selection process provided in the course web page.

Select a problem and formalize

Consider the following aspects to solve the problem with GAs.

- Representation of a chromosome
- Fitness function (fitness scaling, sharing function)
- Operators (Selection, Crossover, Mutation, Knowledge augmented crossover/Mutation, Others)
- Parallel GAs (Include at least one parallel GA: Island model or cellular GA).
  - Elitist strategy combined with binary tournament selection can improve performance and reduce communication costs
- Generation of population (termination criteria)
- Others including constraints

Develop GA codes

Develop and/or search one or more GA codes (include the developer and organization) for computer implementation. Examine the characteristics/effects of the codes in terms of the following factors:

- Representation (bits, order, real numbers) and coding
- Selection method (tournament, ranking, crowding)
- Population in a generation
- Crossover (uniform, one-point, two-point, Knowledge augmented crossover)
- Mutation (embedded in crossover, Cataclysmic mutation (CHC))
- Feasibility after crossover and mutation

Discuss the results

- Crossover and mutation rates
- Parallelism (Island GA, Cellular (fgp) GA)
- Other characteristics

Suggest improvements required in the codes to solve the problem.

Implement the codes and justify the parameters applied.

Discuss and compare the results.