IE5600 Project Briefing: Routing Problems with Time Dependent Travel Time

ISEM, NUS

October 22, 2020

Overview

Project Introduction

The following files have been provided to each project group.

- Project problem description
  - Basic information and features of the problem, objective, constraints, setting
- Reference papers
  - Help to understand the motivation, existing approach and test data
- Data files

Project Requirements I

What are the final outcomes to produce for the project?
A report that resembles a research paper (Refer to the EJOR paper)

- Problem description (, , .)
  - Rewrite in your own words
  - Correct any inaccurate descriptions
  - Add extra paraphrases if necessary
- Mathematical model (Optional)
- Algorithm & approach for solving the problem
  - Meta-heuristic framework
  - Customization/special features of the framework to tackle the main difficulties of solving the problem

Project Requirements II

- (Continuation from previous slide)
- Details of your approach
  - Solution representation
  - Construction algorithm
  - Neighbourhood structure and local search operator
  - Feasibility check of solution, Etc.
- Experiments
  - Briefing description of your implementation and experiment setup
  - Description of test data. Explain and describe how you extend the existing data for your problem, if necessary.
  - Parameter tuning (Optional)
  - Detailed computational results and analysis

How to start? I

- Understand the requirements (based on the previous slides)
- Understand the problem
  - Time-dependent modelling
  - Problem description & features
  - Test data format
- Pick a meta-heuristic framework and customize it for your problem
- Design the different components of your algorithm
  - Solution representation: how do you represent and store a solution in your program
  - Construction algorithm: how to generate initial solutions
  - Local search & neighbourhood structure: How to locate local optimal/best solution within the neighbourhood structure

How to start? II

- Start to program
- Pick any programming language, Python, Java, C++, etc
- Code the following components
  - Read data input
  - Construction algorithm
  - Local search operators
  - Meta-heuristic framework
  - Output results
- Analyse results

Final project deliverable

- Group components
  - Report (refer to the EJOR paper)
  - Program
  - Presentation
- Individual component: one-page self-reflection
  - Your contributions to the project
  - Challenges and lessons learned
  - Suggestion on improving the course project