

Graphs

Introducing

Description

Outline :

- General definitions of graphs
- Some classic graph problems (traversal, connectedness, shortest path, spanning tree, flow) and various associated solving methods.

Practical Labs in Graphs :

- In this lab, the concepts and algorithms of graph theory will be used to solve a standard problem requiring the development of known algorithms. Secondly, we will be asked to design a new algorithm to solve a more innovative problem.
- The programming language is Java.

Objectives

At the end of this module, the student should have understood and be able to explain (main concepts):

- how to use the formalism of graphs for modeling various classical problems in computer science
- The principles of several graph-based problem-solving algorithms.

The student should be able to :

- develop a classical graph algorithm to solve a known problem, but with large datasets,
- develop and compare different implementations of a known algorithm, in order to understand the notions of algorithm complexity,
- propose adaptations of classic algorithms to solve a new problem,

- conduct relevant test campaigns to evaluate the performance of different algorithms.

Necessary prerequisites

- Programming (Ada, C, Python, Java, ...)
- Advanced Algorithms and Complexity (3rd year MIC)
- Algorithms and Data Structures (2nd year MIC and 1st year)

Évaluation

L'évaluation des acquis d'apprentissage est réalisée en continu tout le long du semestre. En fonction des enseignements, elle peut prendre différentes formes : examen écrit, oral, compte-rendu, rapport écrit, évaluation par les pairs...

Practical info

Location(s)

 Toulouse