

## Semester/Diploma/Master Thesis

### Simulation Framework for on-line Graph Algorithms

A distributed computing environment can often be described with a graph, where the vertices represent the computing devices and the edges represent the connections between the devices. One first approach to solve a problem on such a computing grid is to gather all necessary information at a single device, compute the solution, and send it back to the nodes. For many problems, we can achieve much better performance if each vertex computes the solution based on its local view.

An algorithm that computes the solution (or an approximation) based on partial information of the problem is called on-line. Developing and analyzing such on-line algorithms is a non-trivial task, mostly intuit. We often 'execute' such algorithms with paper and pencil on small graphs to verify the correctness or understand certain properties.

In this thesis, the student is asked to develop a simulation framework for on-line algorithms that run on graphs. We are looking for a generic tool that allows us to quickly implement a possible algorithm and run it on several graphs, rendering unnecessary the tedious and error-prone paper and pencil work. The implementation of several novel on-line algorithms is part of the assignment, in order to show the usability of the application.

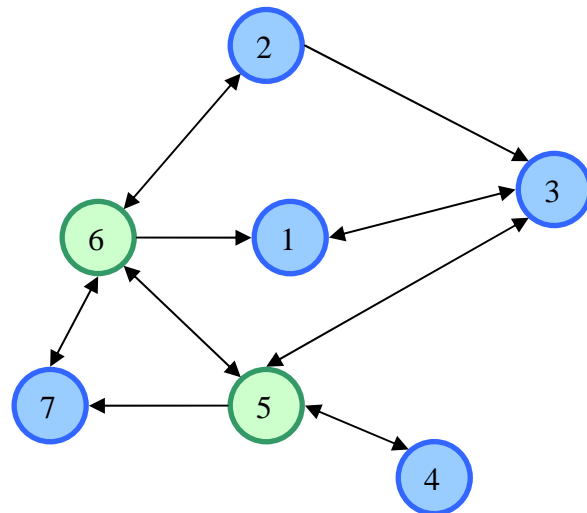


Fig. 1. A possible graph

#### Required skills:

- Proficient in Java programming and software design
- Interest in distributed algorithms

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