

## **Practical statistical network analysis**

The igraph R package provides a platform for developing graph algorithms. As many (classic and recent) algorithms are already included in igraph, it is also handy in exploratory network analysis. igraph has a very simple and fast graph representation, this allows handling of huge graphs, with millions of vertices and edges.

In this lecture, I first introduce igraph's data model, together with the basic concepts of graph theory. Then, I will show some examples for

- centrality measures,
  - community structure detection algorithms,
  - cohesive blocks,
- and how they can be calculated with igraph.

Several examples will be shown for

- creating and importing graphs from collected data or from other formats,
- graph visualization,
- rapid prototyping of graph algorithms.

Basic calculus, statistics and R knowledge is expected.