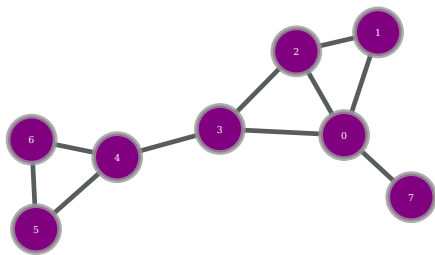


Complex Networks

Snehal M Shekatkar

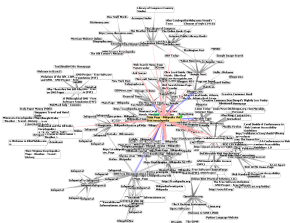
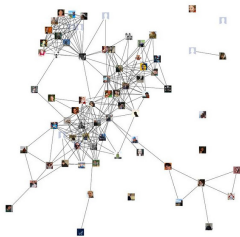
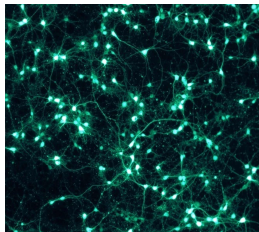
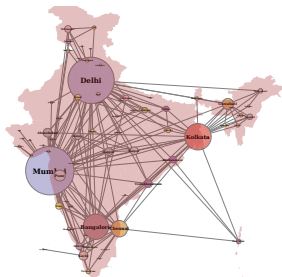
1. What and why?
2. Real-world problems
3. Methods

What are networks?



- ▶ vertices, nodes
- ▶ edges, links
- ▶ graph, network

Examples



Relevant areas

- ▶ Transportation
 - ▶ Traffic congestion
 - ▶ Planning of new roads
- ▶ Information and Technology
 - ▶ Designing Internet protocols
 - ▶ Search engines
- ▶ Biological sciences
 - ▶ Network medicine
 - ▶ Bioinformatics
- ▶ Social Sciences
 - ▶ Recommender systems
 - ▶ Social networking dynamics
 - ▶ Disease spreadings
- ▶ Economics

Methods

- ▶ Sociology
- ▶ Statistics
- ▶ Computer science
- ▶ Statistical physics
- ▶ Graph theory
- ▶ Information theory

Prerequisites

1. Basics of calculus and linear algebra
2. Basics of algorithms
3. Working knowledge of one programming language