MLSS PRACTICAL

Network Modeling & Information Propagation

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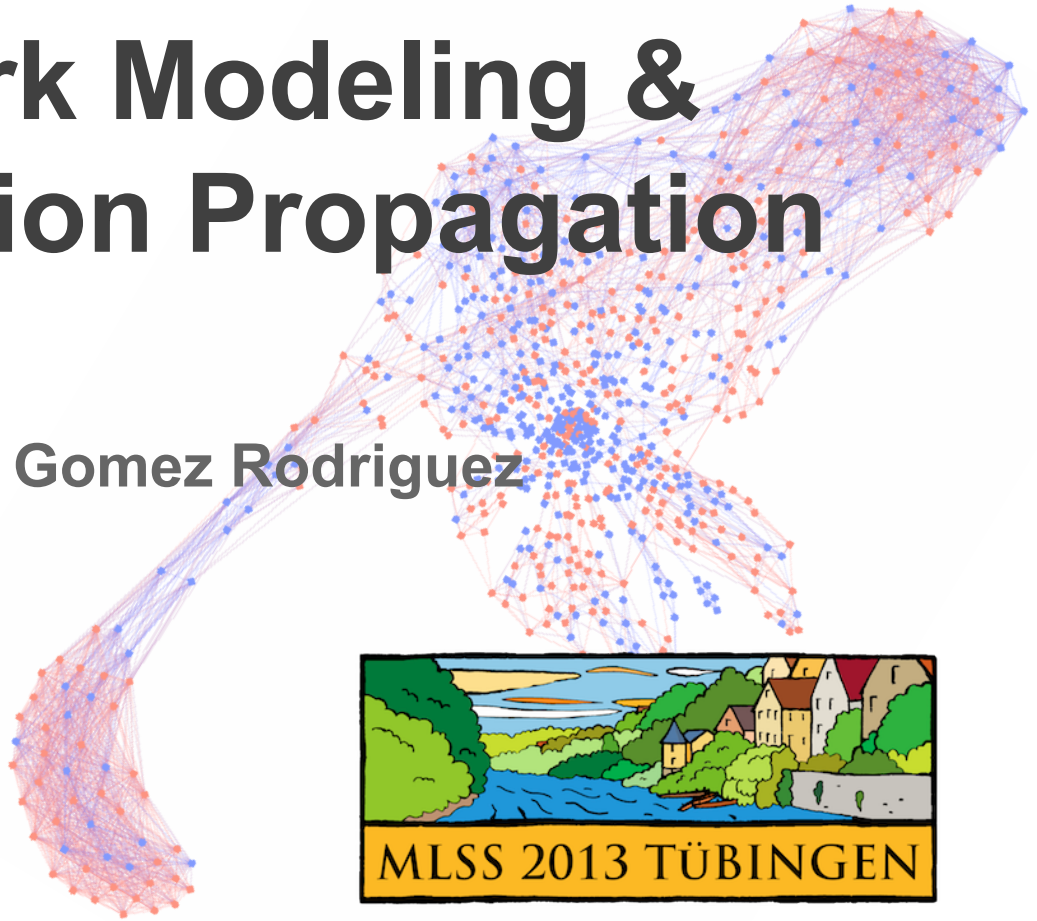


MAX-PLANCK-GESELLSCHAFT

Networks and Graphs

Networks are everywhere:

Electrical networks **Computer networks**

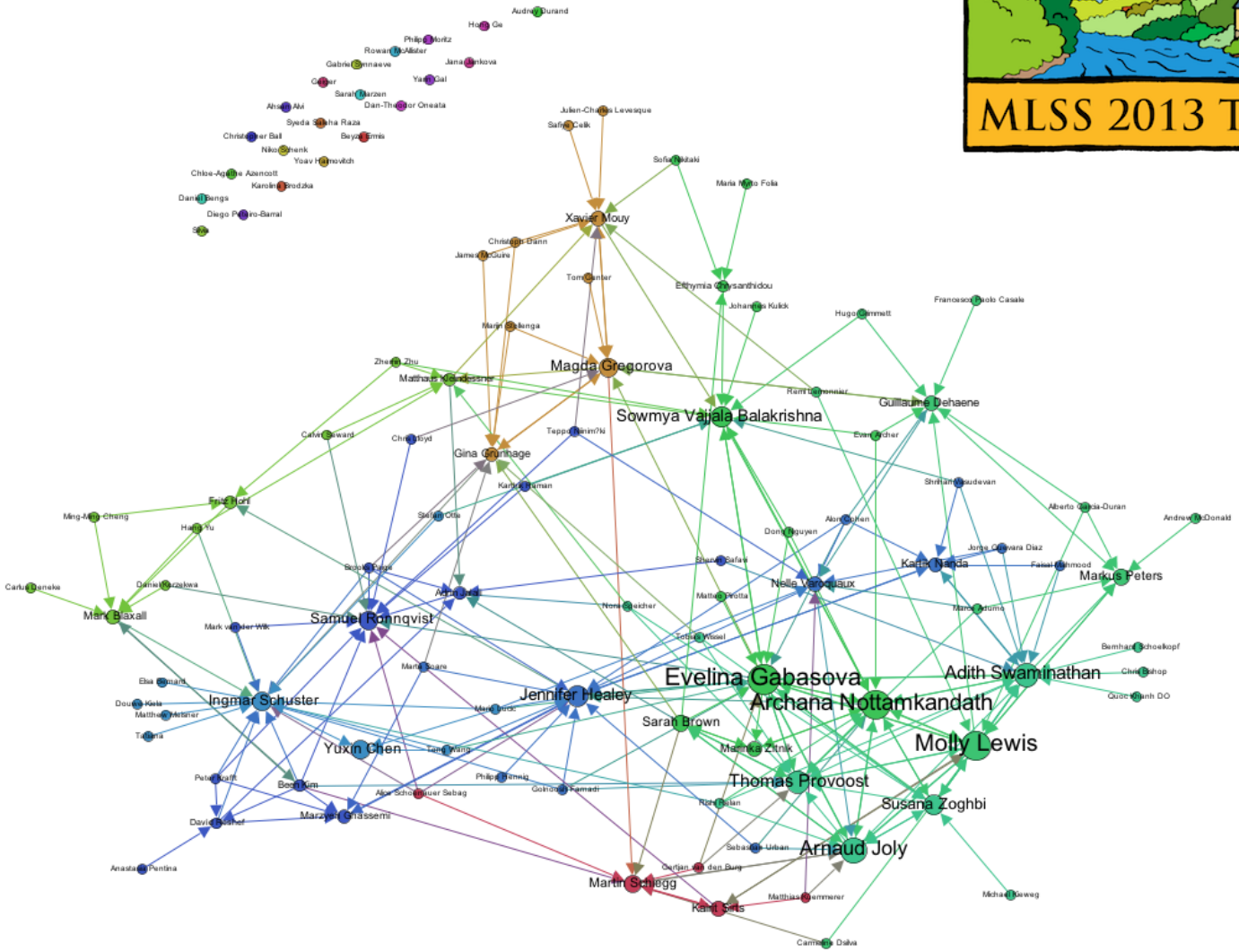
Social networks **Information networks**

Biological networks **Traveling networks**

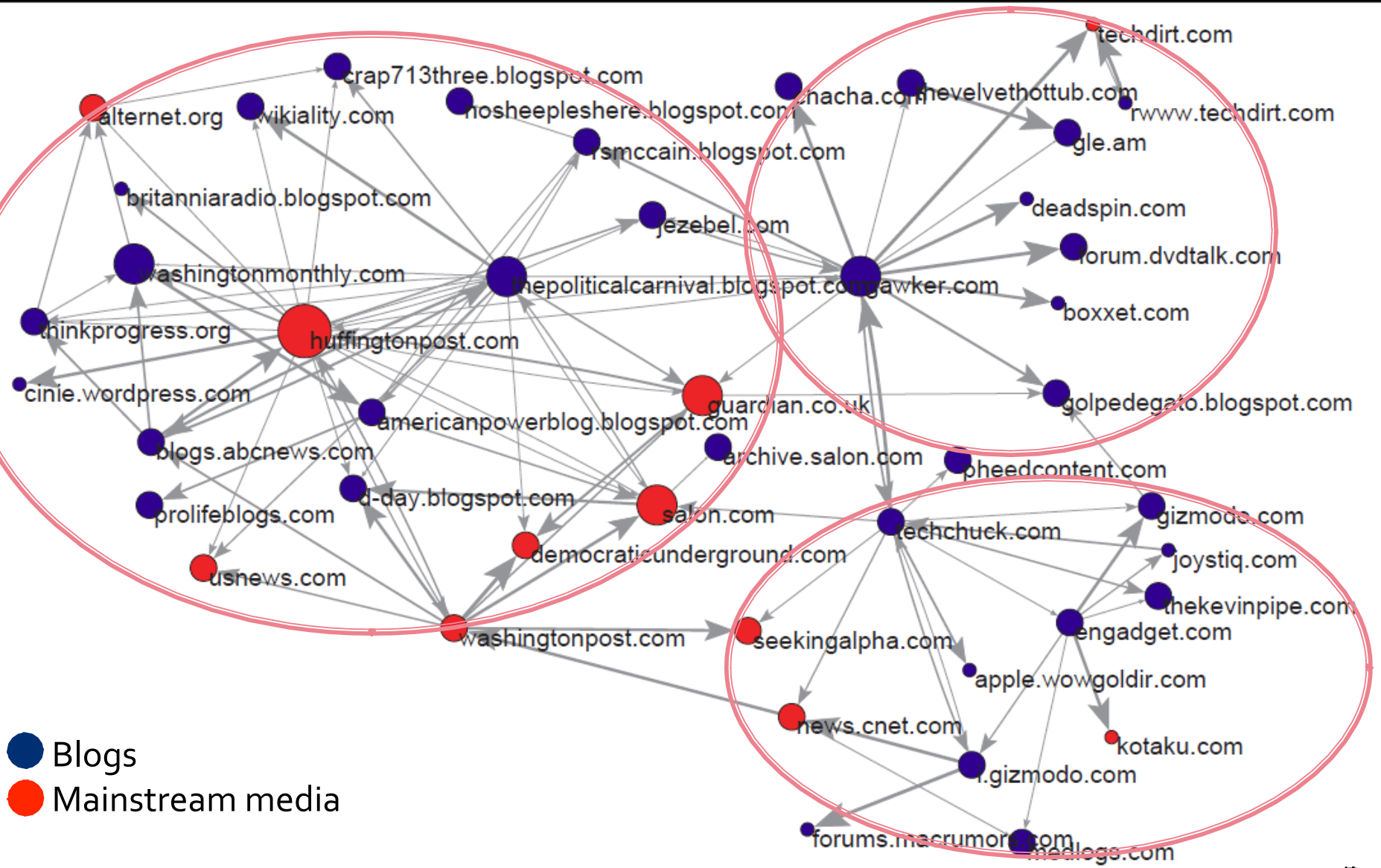
Network mining, analysis, inference, etc… on real networks presents **many challengues**:

- Networks are usually **sparse** (efficient storage/access)
- Networks may be **huge** (10^6 nodes/10^9 of edges)
- Networks are **dynamic** (updates should be efficient)

MLSS contact network (Aug 26)



Static information network



Networks inferred with **NETINF**: **http://snap.stanford.edu/netinf/**

Dynamic information network

Networks inferred with **INFOPATH**: **http://snap.stanford.edu/infopath/**

Propagation over Networks

PROPAGATION TAKES PLACE ON

Information Networks

Social Networks

Recommendation Networks

Epidemiology

Human Travels

WE CAN EXTRACT PROPAGATION TRACES FROM

Practical Outline

	Tools for **Network Analysis and Visualization**	**Models and algorithms**
1st Part	SNAP (C++) →	Social Networks Models: 1. Forest Fire Model 2. Kronecker Graph Model
2nd Part	Gephi (GUI) →	Social Networks Mining: 1. Visualization 2. Properties 3. Manipulation
3rd Part	SNAP + Gephi →	Information Propagation: 1. Indep. Cascade Model 2. Influence Maximization

Getting started

1. Download the handout to your personal laptop:

`ftp:///172.16.172.16/pub/networks/handout-networks.pdf`

2. Download Gephi to your personal laptop:

`http://gephi.org/users/download/`

`ftp://172.16.172.16/pub/networks/`

3. SSH (windows users, use putty) to mlss1.is.localnet, download the code package (includes SNAP) & compile it:

user: mlsXXX, password: mlss379

```
> ssh 172.16.172.16
> wget ftp://172.16.172.16/pub/networks/code-networks.tgz
> tar zvfx code-networks.tgz
> cd code-networks/
> make
```

4. You are ready to start reading the handout!