Complex Networks team

`http://complexnetworks.fr`

LIP6 laboratory (CNRS, Sorbonne Université)

Networks/graphs from different contexts

computer science: internet, P2P, web, usages, etc.

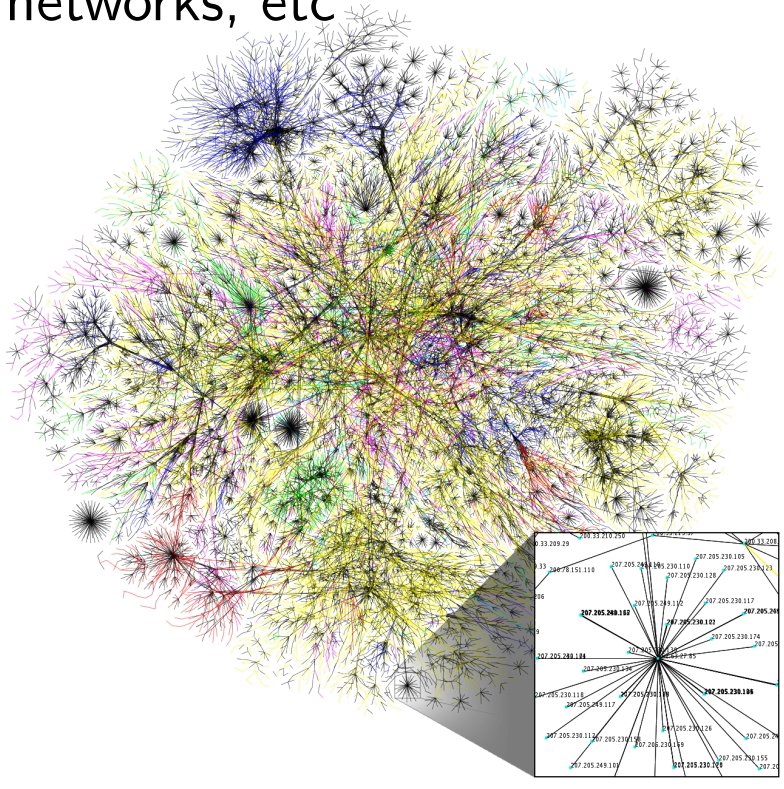
social sciences: friendships, communications, collaborations, exchanges, economics, etc.

biology: brain, genes, proteins, ecosystems, etc.

linguistics: synonymy, co-occurrences, etc.

transportation: roads, air, electrical networks, etc

etc



Various contexts, but

- common properties
- common problems to solve

Some common questions

Algorithmic questions

Efficient computations on very large networks

Modeling

Generate artificial networks resembling a given network

$\Rightarrow$ Goals: understanding, simulations, ...

Analysis

How to describe the structure of very large networks?

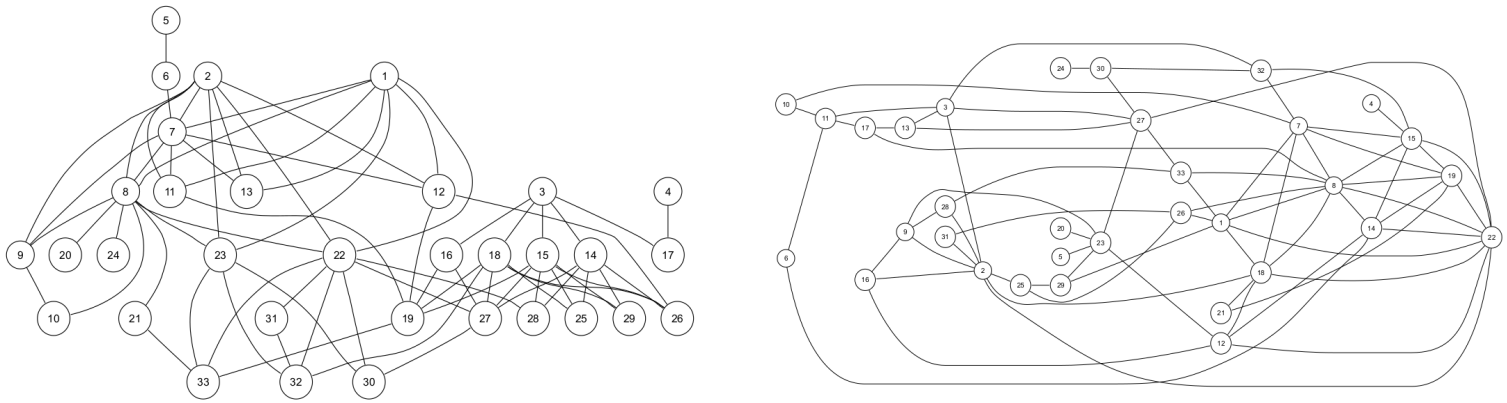
Practical use of the configuration model

supervision: Lionel Tabourier, Matthieu Latapy @LIP6

About the configuration model

- what: generate graphs with a given degree sequence
- why: better resemblance to real-world networks

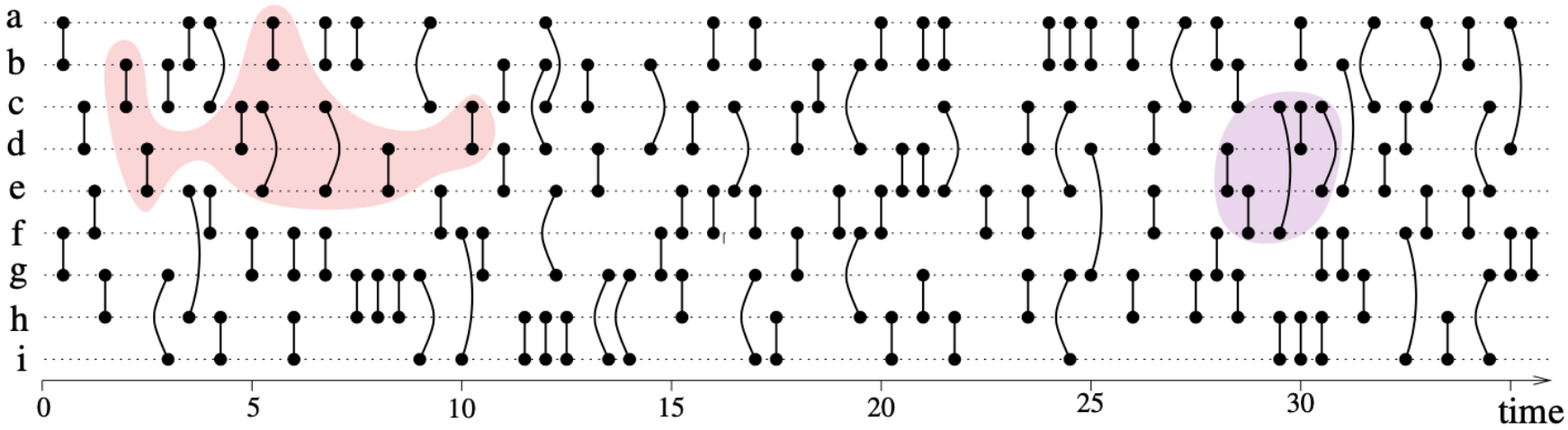
ex: Chesapeake bay ecosystem, real vs model



About the internship

- problem: no uniform generation in polynomial time
- internship: algo to guarantee polynomial uniform generation

Anomaly Detection in Link Streams



A **link stream** represents interactions among entities over time.

Examples:
- Message exchanges
- Financial transactions
- Contacts among people

Interactions in shaded areas may be traces of frauds or attacks.

Internship: Using concepts from graph theory to identify suspicious links

We aim to explore **Random Walks**, **PageRank**, **Community Detection**, **Centrality**, etc.

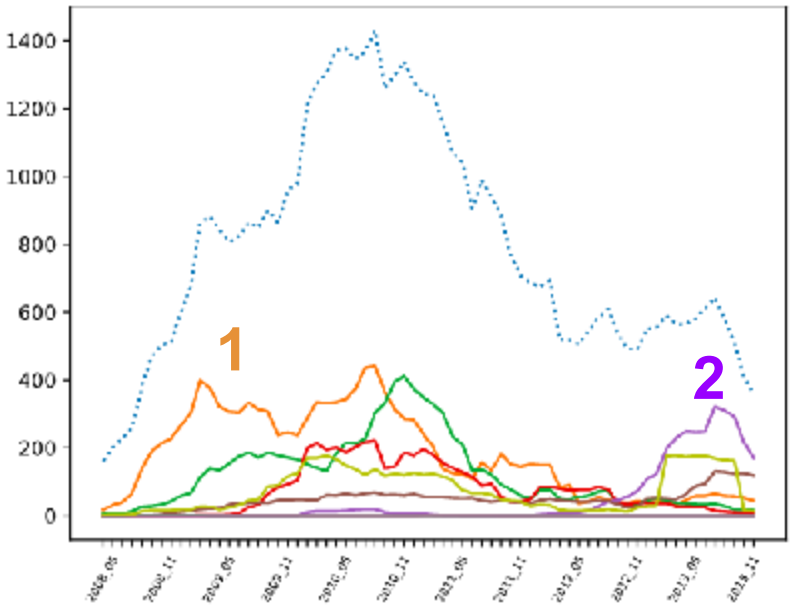
Profile: students with a strong interest in algorithms, graph theory, and/or signal processing and their applications.

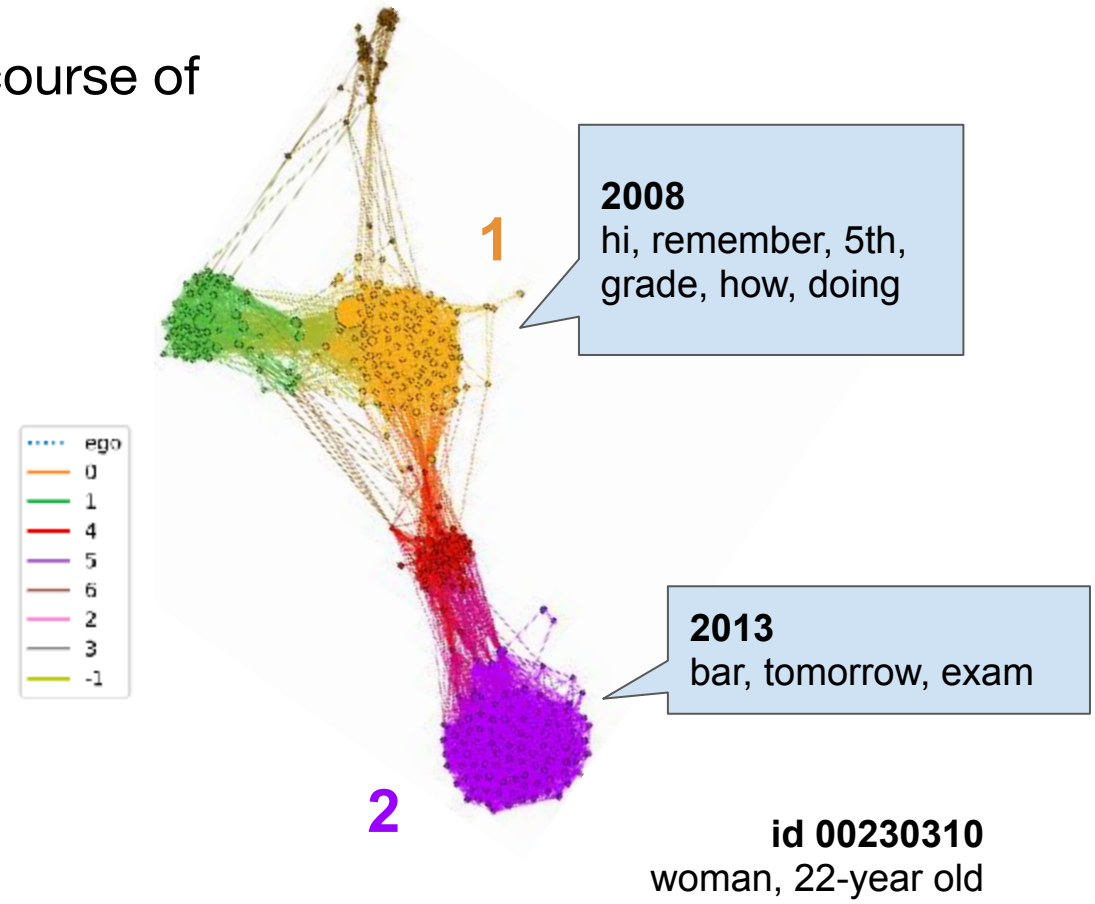
Place: Complex Networks team of the LIP6 (SU-CNRS)
Supervision: Matthieu Latapy (CNRS / SU), Esteban Bautista (SU) and Mehdi Naima (SU)

networked timelines

Christophe Prieur (christophe.prieur@univ-eiffel.fr)

detection of changes in the life course of many personal networks





Algopol survey: 15k Facebook timelines

Conclusion

Topics require

- some data manipulation
- some formal approaches
- some taste in interdisciplinary matters

To be discussed with the applicant

More details: `http://www.complexnetworks.fr/projects/`

Contact: `stages@complexnetworks.fr`