Network Elements

Part 01

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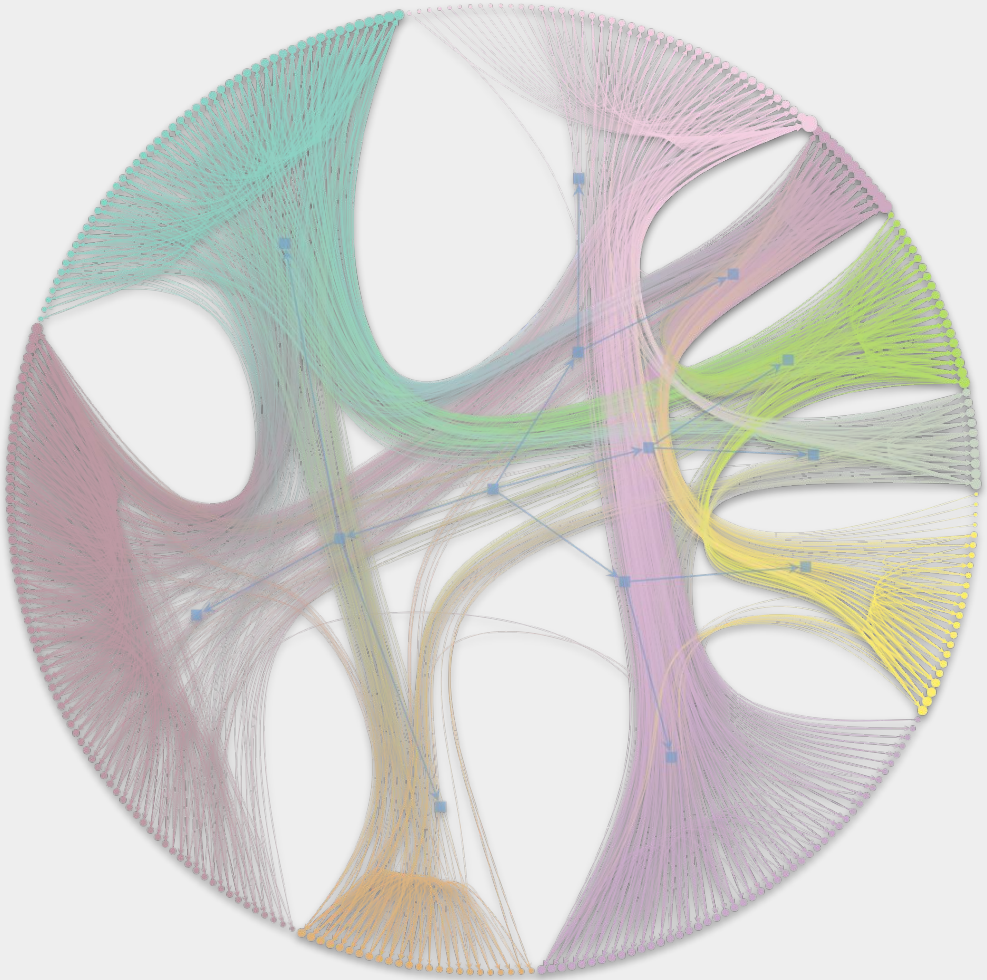
@ivanovitchm



Conhecendo

📚 conhecendo
👂 ouvindo
📖 lendo
📝 escrevendo/anotando
🧑‍🎓 estudando

<conteúdo e objetos de aprendizagem>

Descobrindo

🔍 pesquisando
👀 observando
🕵️ investigando
🧪 testando

<aprendizagem ativa e curadoria>

aqui a aprendizagem acontece

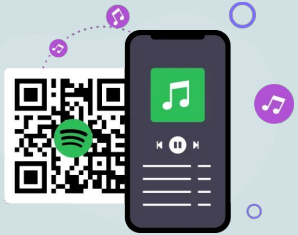
Partilhando

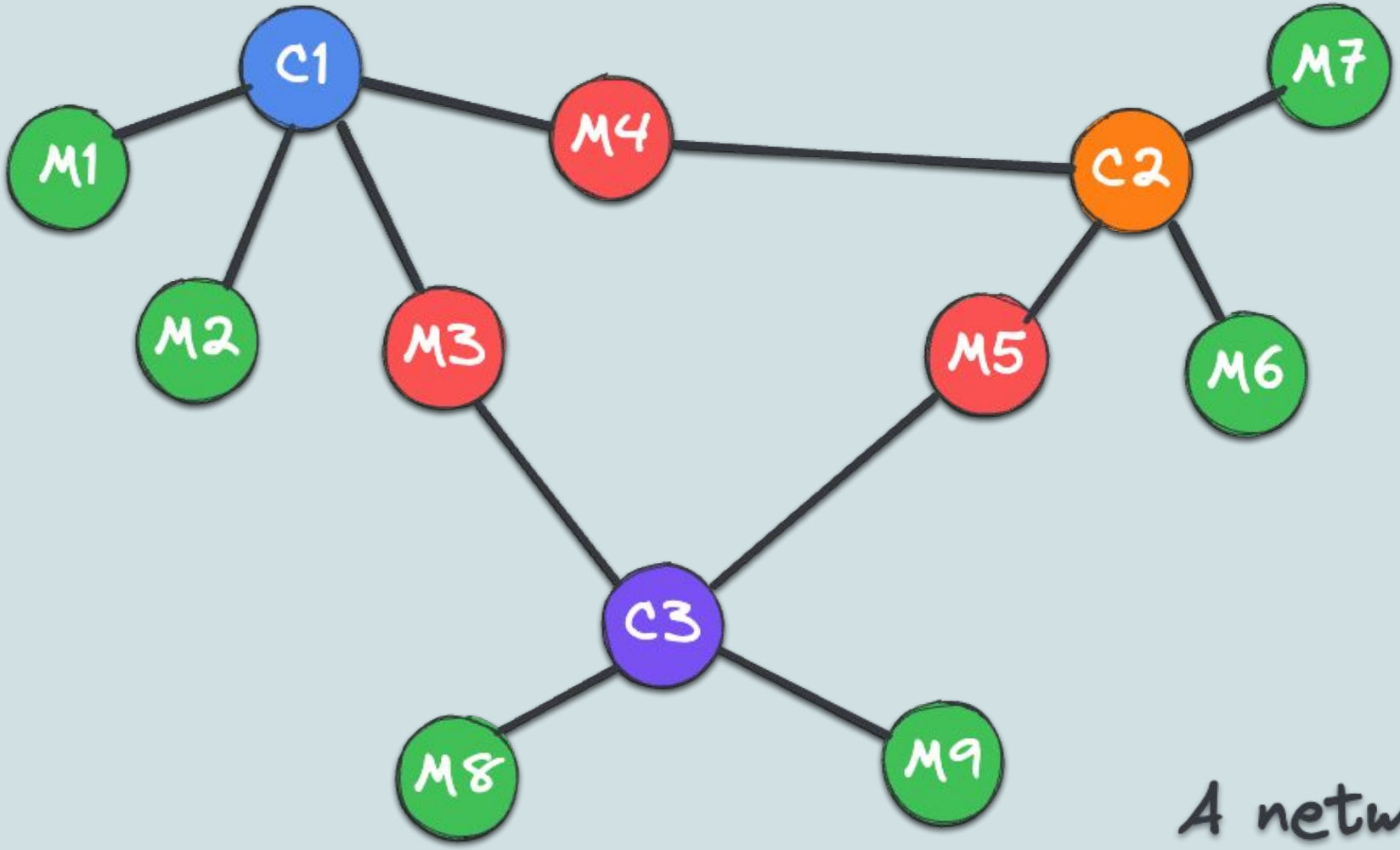
💬 dialogando
💭 debatendo
🗣️ discutindo
👥 explicando
🎓 ensinando
🤝 trocando

<espaços, plataformas, redes e comunidades>

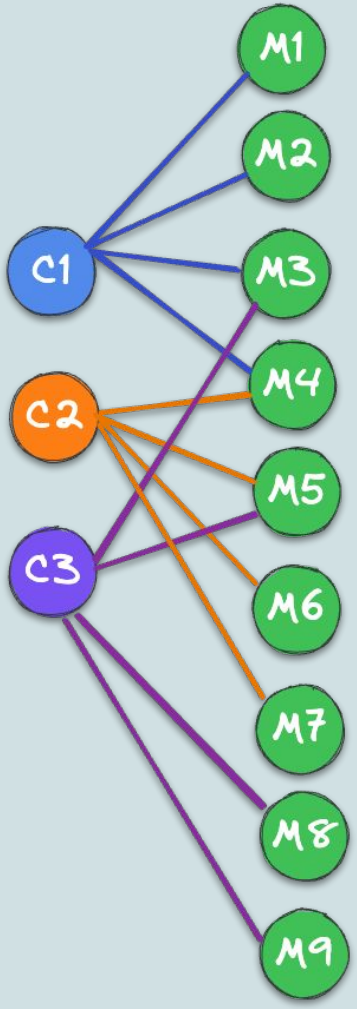
Experenciando

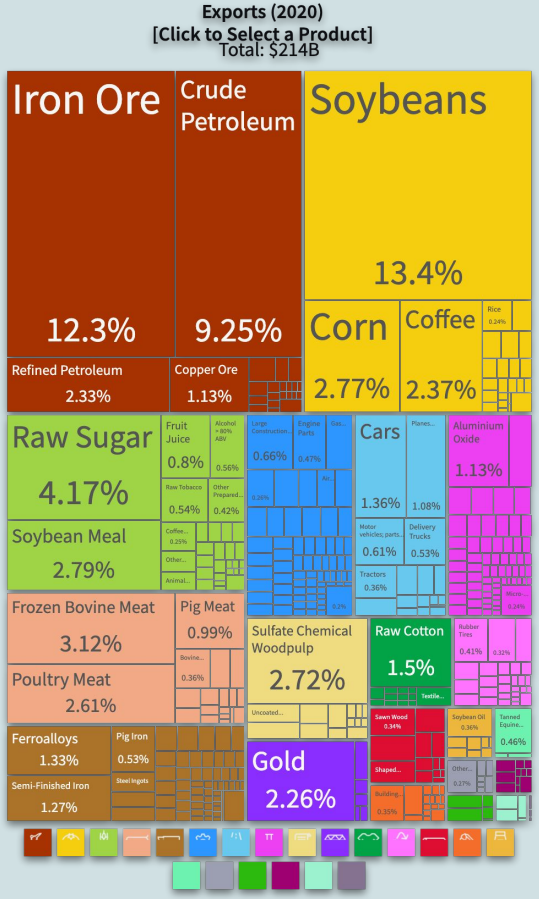
🏋️ praticando
🤔 dando sentido
🧘 vivenciando
🎨 criando
😍 sentindo
🧩 conectando os pontos

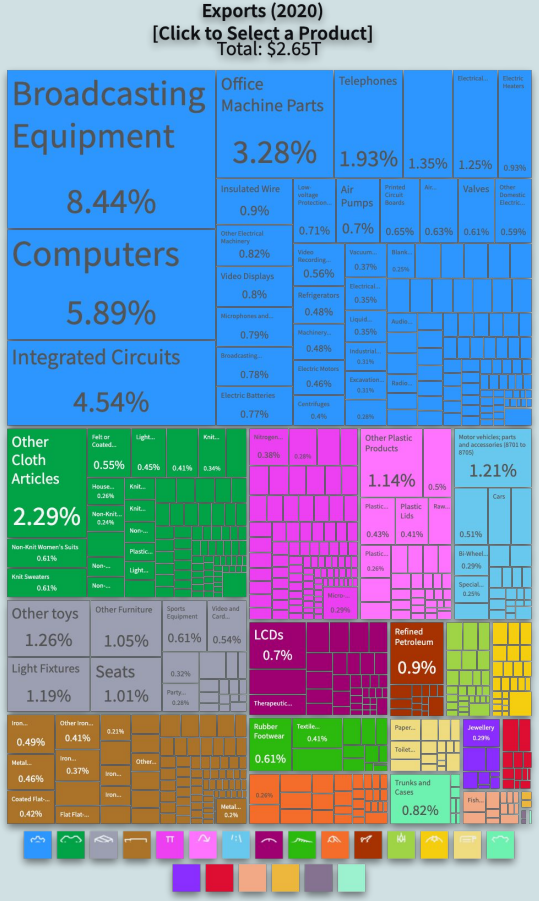




A network



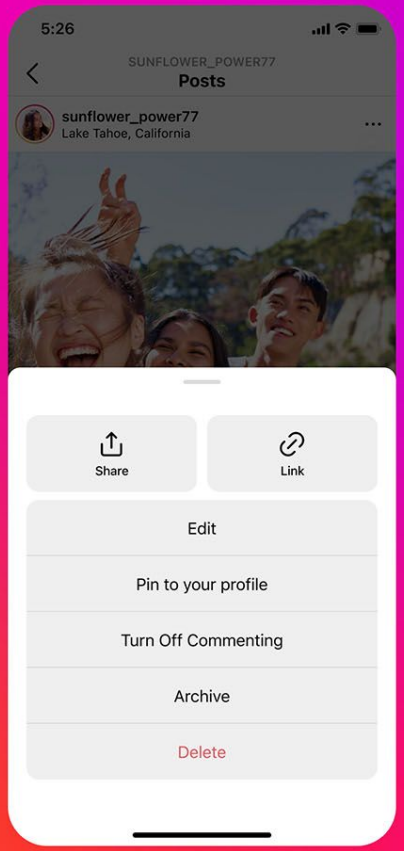




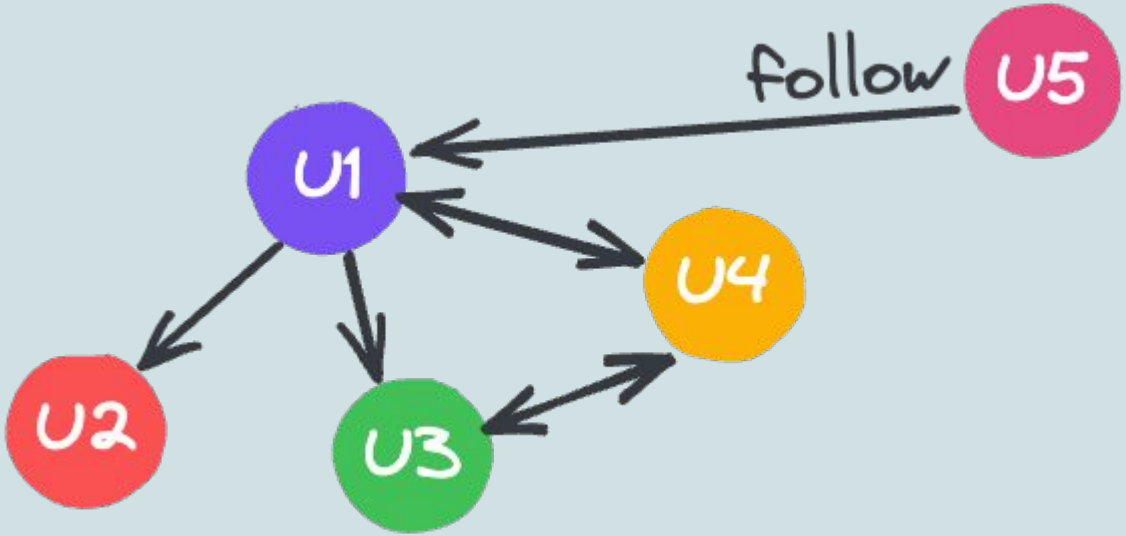
https://oec.world/en/profile/country/chn

bipartite network

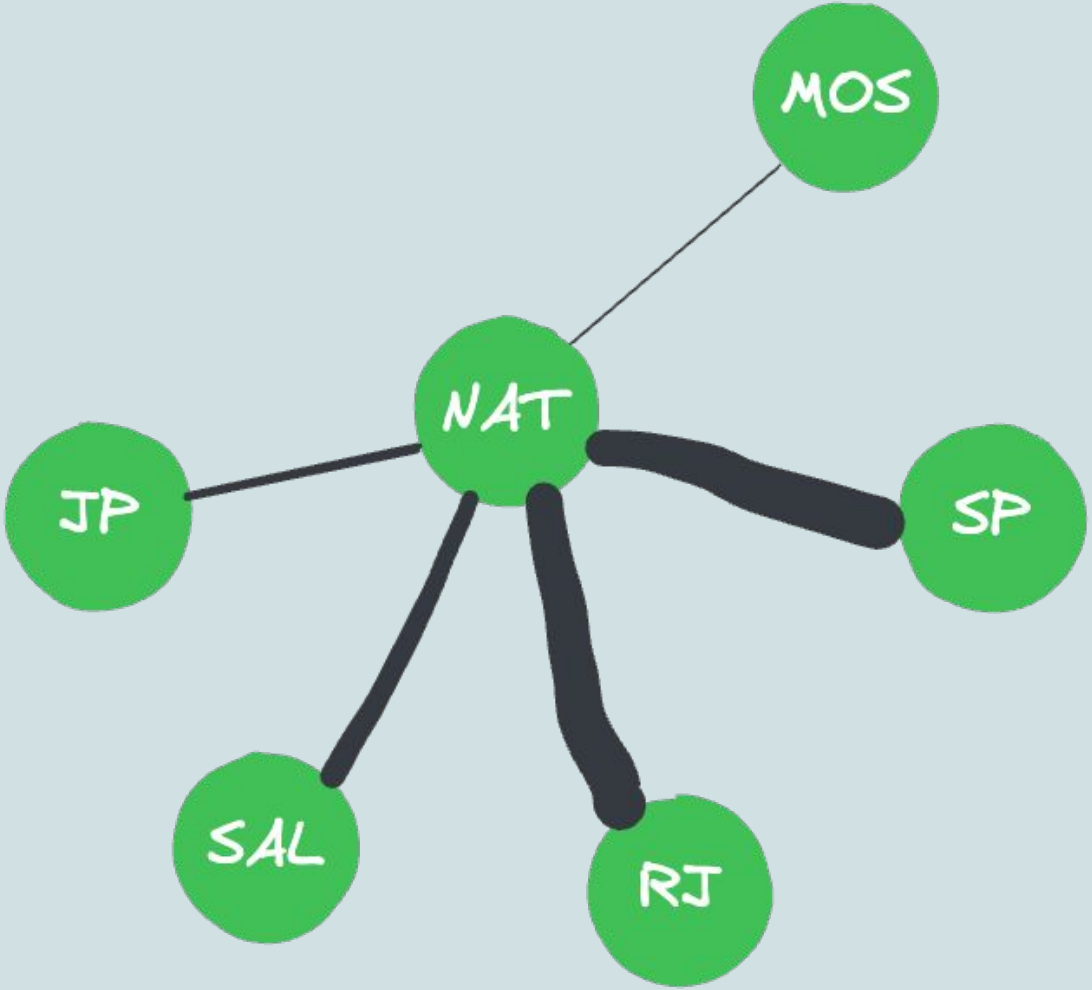
5:26
SUNFLOWER_POWER77
Posts
sunflower_power77
Lake Tahoe, California
Now you can pin posts to your profile
Liked by liam_beanz99 and 12 others
sunflower_power77 Lake trip with the best ❤️
#laketahoe2022
View all 5 comments
Add a comment...
1 day ago

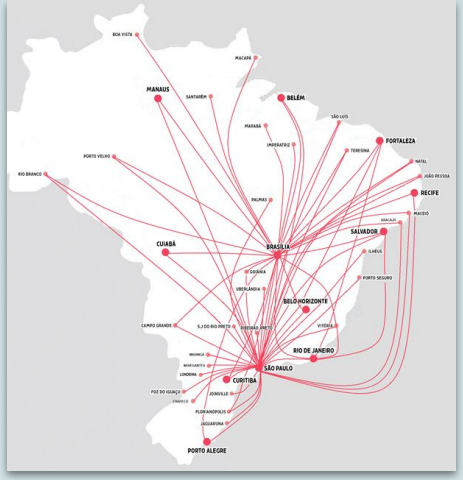

5:26
SUNFLOWER_POWER77
Posts
sunflower_power77
Lake Tahoe, California
Share
Link
Edit
Pin to your profile
Turn Off Commenting
Archive
Delete

5:26
sunflower_power77
54
Posts
852
Followers
756
Following
Autumn Lopez
Big into hiking & nature 🌲
Edit Profile
Travel
Nature
Hikes
New


follow
U5
U1
U4
U2
U3

leomessi
Following
Message
1,025 posts
457M followers
292 following
Leo Messi
Bienvenidos a la cuenta oficial de Instagram de Leo Messi / Welcome to the official Leo Messi Instagram account
themessistore.com

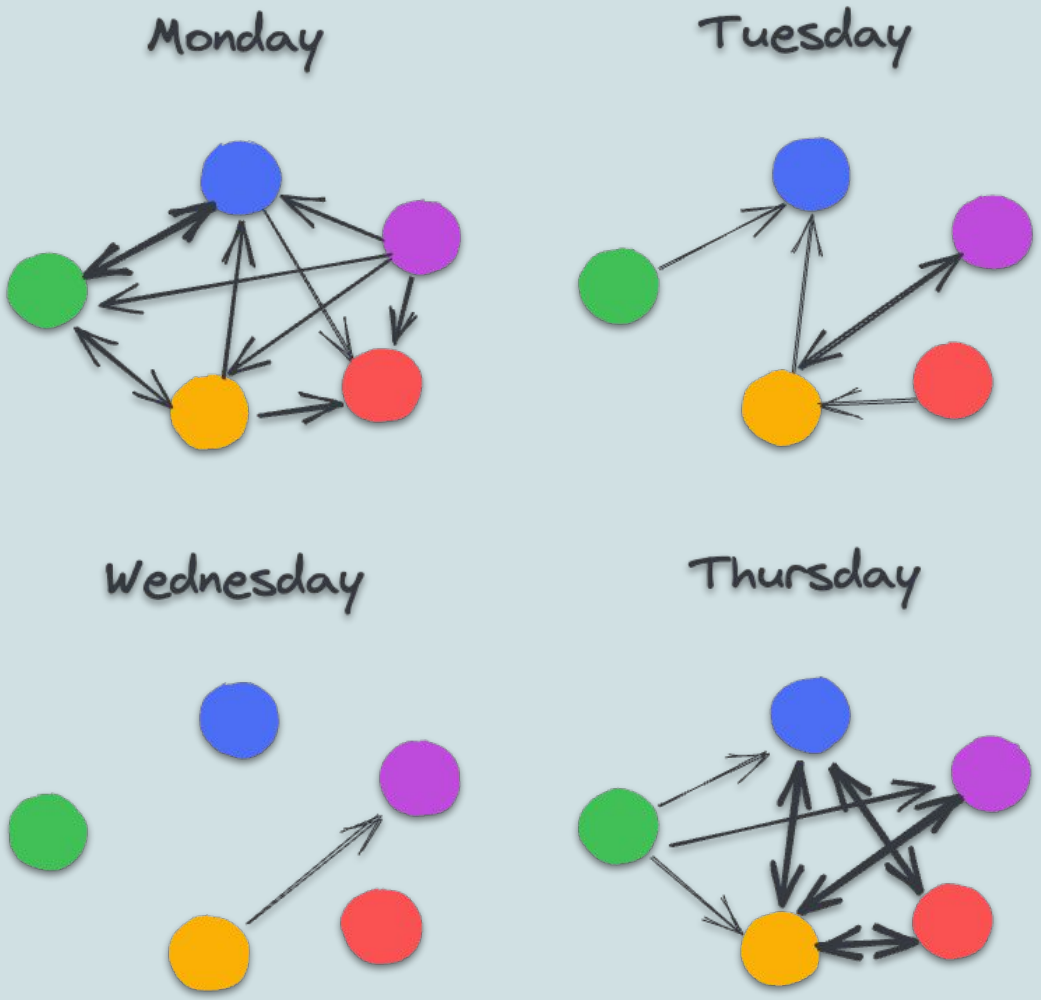

MOS
NAT
JP
SP
SAL
RJ


BOA VISTA
MACAPÁ
MANAUS
SANTARÉM
BELÉM
SÃO LUÍS
MARABÁ
IMPERATRIZ
FORTALEZA
TERESINA
PORTO VELHO
RIO BRANCO
NATAL
JOÃO PESSOA
RECIFE
PALMAS
MACEIÓ
ARACAJU
SALVADOR
CUIABÁ
BRASÍLIA
ILHÉUS
GOIÂNIA
PORTO SEGURO
UBERLÂNDIA
BELO HORIZONTE
CAMPO GRANDE
S.J DO RIO PRETO
ARAÇATUBA
VITÓRIA
RIO DE JANEIRO
MARINGÁ
SÃO PAULO
MARGARETE
LONDRINA
CURITIBA
FOZ DO IGUAÇU
JOINVILLE
CHAPECÓ
FLORIANÓPOLIS
JAGUARUNA
PORTO ALEGRE

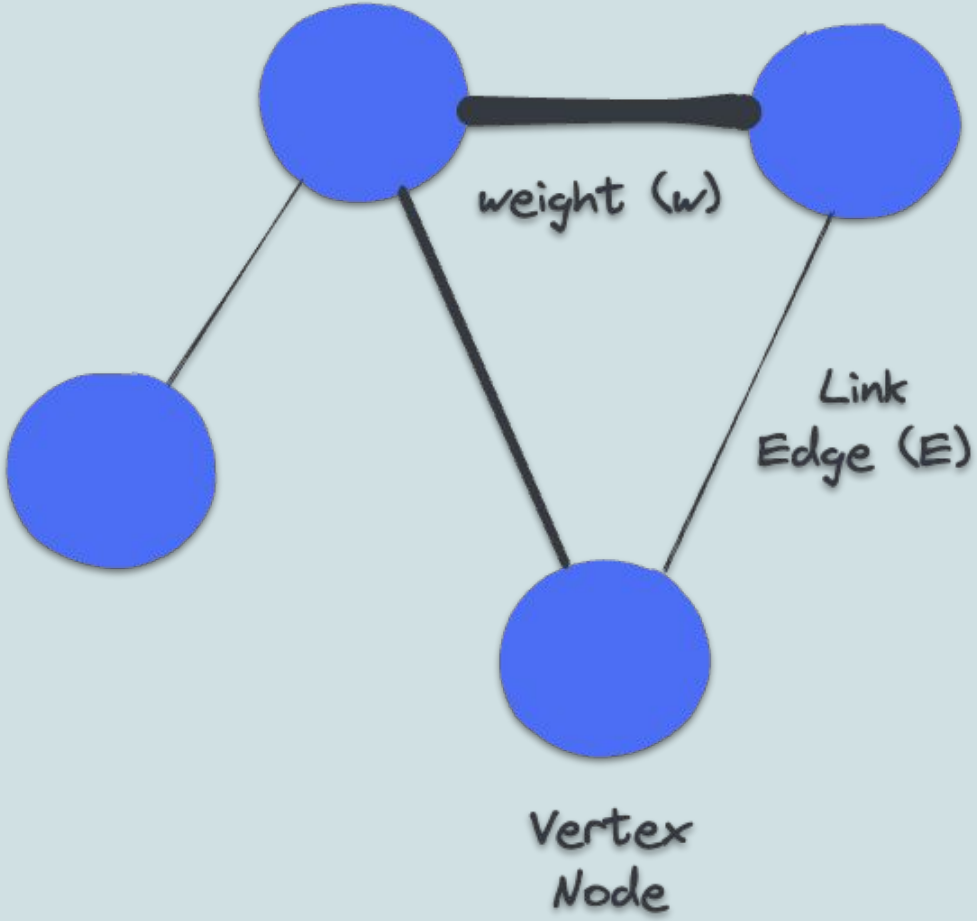
WhatsApp

GitHub

https://github.com/kurasaiteja/Whatsapp-Analysis



Temporal network

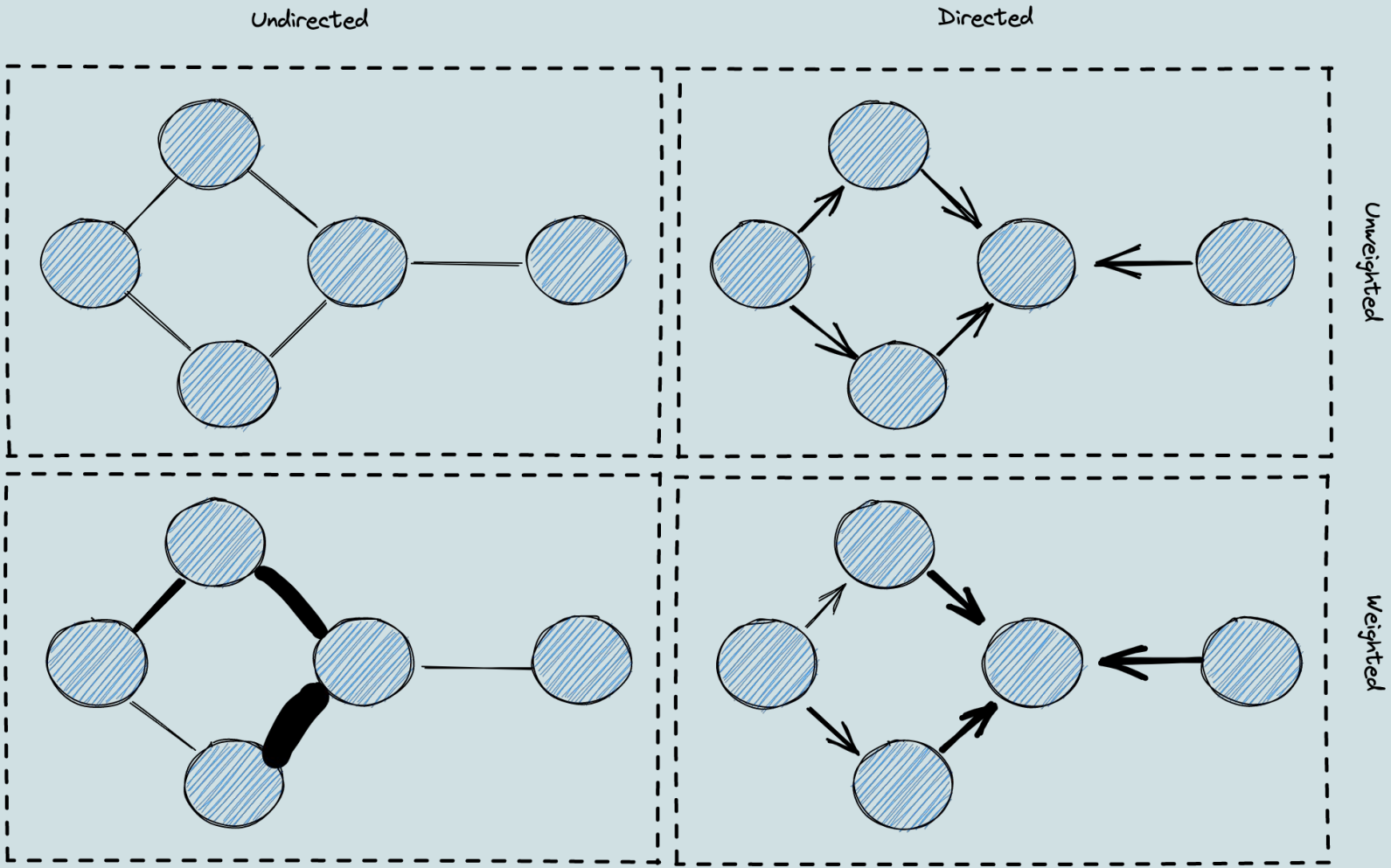


Basic Definitions

$$G = (V, E, W)$$

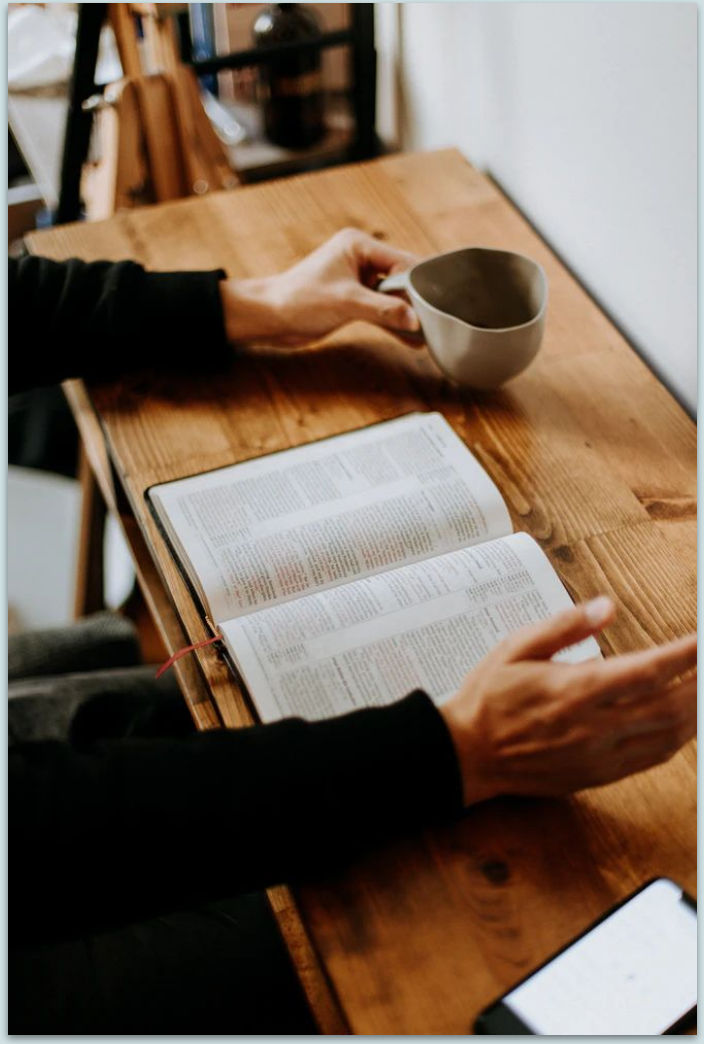
$$E \subseteq V \times V$$

$$W \subseteq R^{+}$$


Undirected
Directed
Unweighted
Weighted

Other Fundamental Properties

Density and Sparsity
Subnetwork
Degree
Network Representation



Further Reading

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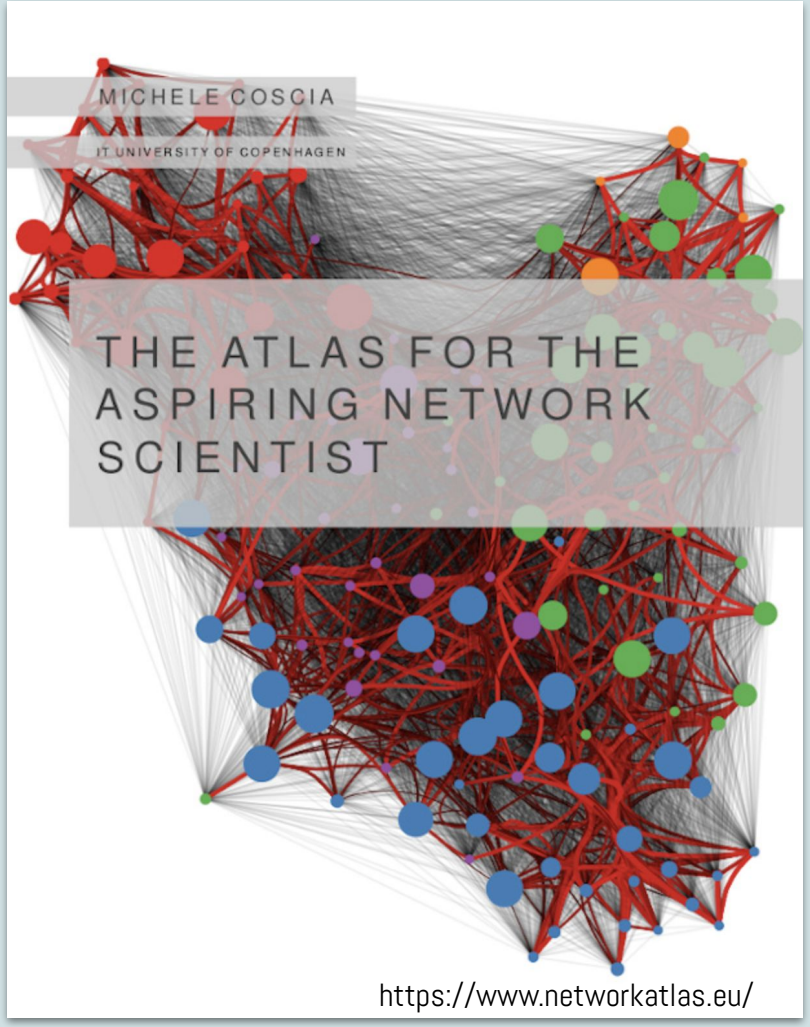


NetworkX

Network Analysis in Python

Contact

Mailing list
Issue tracker
Source

Releases

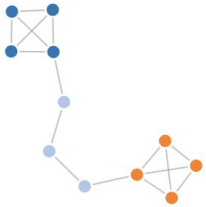
Stable (notes)

3.1 — April 2023
Documentation

Latest (notes)

3.2 development
Documentation

Archive



NetworkX is a Python package for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks.

Software for complex networks

- Data structures for graphs, digraphs, and multigraphs
- Many standard graph algorithms
- Network structure and analysis measures
- Generators for classic graphs, random graphs, and synthetic networks
- Nodes can be "anything" (e.g., text, images, XML records)
- Edges can hold arbitrary data (e.g., weights, time-series)
- Open source 3-clause BSD license
- Well tested with over 90% code coverage
- Additional benefits from Python include fast prototyping, easy to teach, and multi-platform

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https://networkx.org/

graph-tool | Efficient network analysis

Download | Documentation | Discussion | Git | Issues

What is graph-tool?

Graph-tool is an efficient Python module for manipulation and statistical analysis of graphs (a.k.a. networks). Contrary to most other Python modules with similar functionality, the core data structures and algorithms are implemented in C++, making extensive use of template metaprogramming, based heavily on the Boost Graph Library. This confers it a level of performance that is comparable (both in memory usage and computation time) to that of a pure C/C++ library.

Download version 2.54

Installation instructions | Changelog

Conda installation (GNU/Linux | MacOS)

```
conda create --name gt -c conda-forge graph-tool
conda activate gt
```

It is *Fast!*

Despite its nice, soft outer appearance of a regular Python module, the core algorithms and data structures of graph-tool are written in C++, with performance in mind. Most of the time, you can expect the algorithms to run just as fast as if graph-tool were a pure C/C++ library. See a performance comparison.

OpenMP Support

Many algorithms are implemented in parallel using OpenMP, which provides excellent performance on multi-core architectures, without degrading it on single-core machines.

Extensive Features

An extensive array of features is included, such as support for arbitrary vertex, edge or graph properties, efficient "on the fly" filtering of vertices and edges, powerful graph I/O using the GraphML, GML and dot file formats, graph pickling, graph statistics (degree/property histogram, vertex correlations, average shortest distance, etc.), centrality measures, standard topological algorithms (isomorphism, minimum spanning tree, connected components, dominator tree, maximum flow, etc.), generation of random graphs with arbitrary degrees and correlations, detection of modules and communities via statistical inference, and much more.

Powerful Visualization

Conveniently draw your graphs, using a variety of algorithms and output formats (including to the screen). Graph-tool has its own layout algorithms and versatile, interactive drawing routines based on cairo and GTK+, but it can also work as a very comfortable interface to the excellent graphviz package.

Fully Documented

Every single function in the module is documented in the docstrings and in the online documentation, which is full of examples.

https://graph-tool.skewed.de/