

Lecture 3

Complex Network Analysis

Tools for

CNA

Book

“Complex Network Analysis
in Python”

Dmitry Zinoviev

The Pragmatic Programmer
2017

<https://pragprog.com/book/dzcnapy/complex-network-analysis-in-python>

Get
the
source
code
here



networkX
1.0

The
Pragmatic
Programmers

Complex Network Analysis in Python

Recognize → Construct → Visualize →
Analyze → Interpret



Dmitry Zinoviev
edited by Adaobi Obi Tulton

Today:
Chapters

3, 4 & 5

Tools

- python 3.0 (or greater)
- networkx 2.0 (or greater)

Instructor's distribution:

Anaconda on MacOS

Jupyter

5.0.0

Gephi (Java)

...

R + igraph (available also for python)

Pejax

many others

Other libraries (Python)

iGraph

graph Tool

networkx

...

(← for
large
scale
graphs)

you need to install
also these:

community

matplotlib

pendulum

wikipedia

topsort

within Ane Guide
you get almost
every thing, but:

pip install topsof
= = wikipedia
= = python-burain

then install

Graphviz
(including the developers
add-on
graphviz-dev)

then you can:

pip install pygraphviz

Finally:

download
package

book's author
clzcnepy-plotlib.py

NetworkX

easy to install
easy to understand
and use

fully implemented in
Python
(so it inefficient
with large datasets)

no built in
+ community Detection
+ advanced layouts

You have to install
other packages or
Gephi

Introduction to Python

download and execute
step by step these
notebooks (on moodle):

01 - Python - introduction.ipynb

02 - Glob - Pickle .ipynb

03 - Pandas - intro .ipynb

(data from: DataSets.txt)

Author: Dr. Flavio Disdoro

this is on your
OWN -

Introducing NetworkX

(Chapter 3)

1. Learn how to manually create a network

01 - Network Creation.ipynb

2. Learn how to read a network from a CSV file

3. Learn how to visualize a network with Matplotlib

4. Learn how to save your graph to a format readable from Gephi

02 - Nutrients.ipynb

Introducing Gephi

(Chapter 4)

1. import existing network data
2. modify the network
3. change size and color of nodes, text, and edges

Constructing a network of Wikipedia Pages

(Chapter 5)

1. Start from a SEED page
2. run a simple snowballing process
3. Create a directed Graph
4. Perform some cleaning
5. Perform basic analysis
6. Save data for Gephi to create better visualization

03_ wikipedia.ipynb