

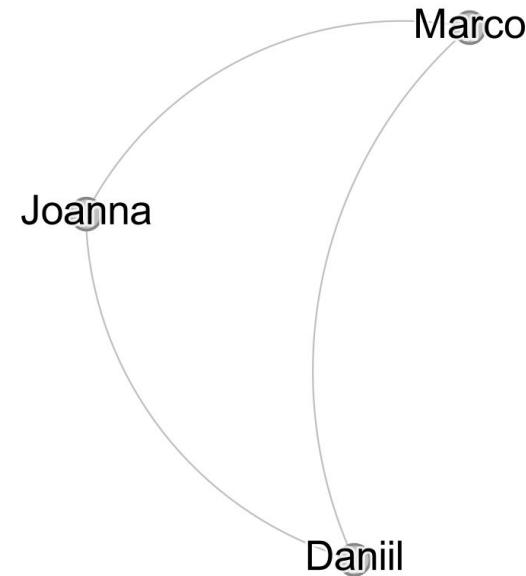
How do we store networks in
machine-readable form?

a CSV table with network edges is a popular option:

Daniil,Joanna

Joanna,Marco

Daniil,Marco

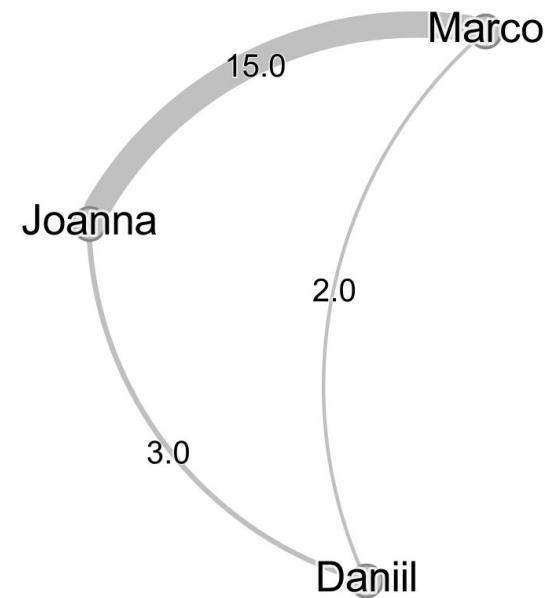


Adding weight information:

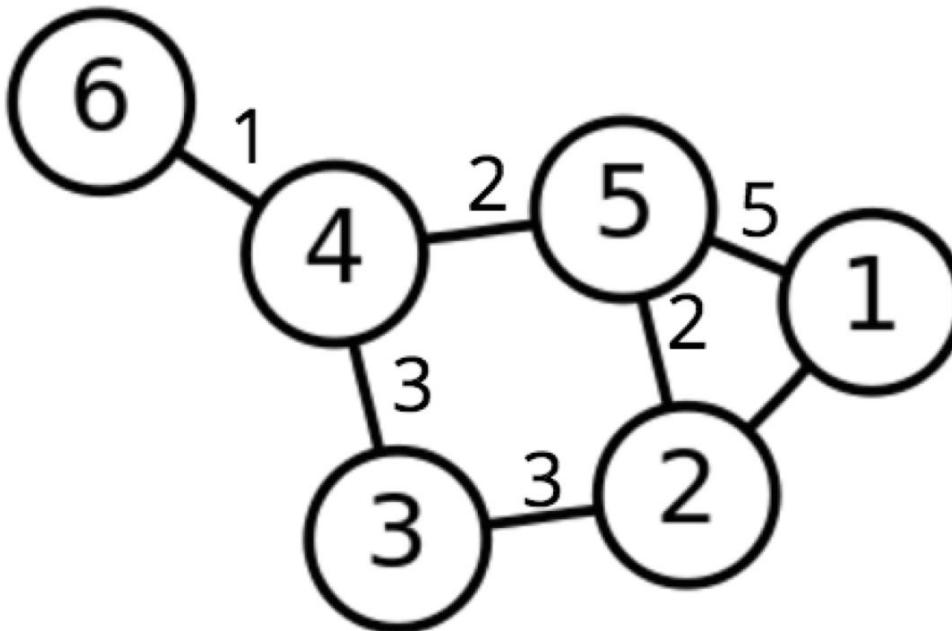
Daniil, Joanna, 3

Joanna, Marco, 15

Daniil, Marco, 2



BTW we just introduced a weighted network (graph)

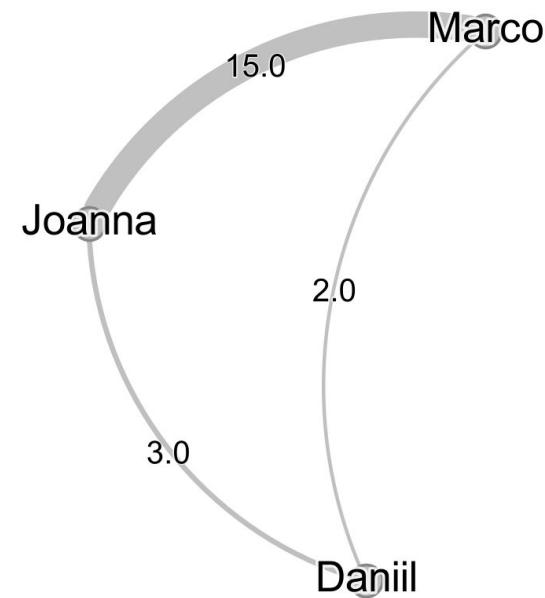


Adding weight information:

Daniil, Joanna, 3

Joanna, Marco, 15

Daniil, Marco, 2



Another format: GraphML

XML-based format for network storage

```
<graphml>
  <graph id="G" edgedefault="undirected">
    <node id="n0"/>
    <node id="n1"/>
    <edge id="e1" source="n0" target="n1"/>
  </graph>
</graphml>
```

Another format: GEXF

Graph Exchange XML Format is another XML-based format, but this one is more complex and feature-rich. It allows for storing lots of metadata and visualisation parameters

```
<gexf>
  <meta lastmodifieddate="2018-03-20">
    <creator>Gexf.net</creator>
    <description>A hello world! file</description>
  </meta>
  <graph mode="static" defaultedgetype="directed">
    <nodes>
      <node id="0" label="Hello" />
      <node id="1" label="Word" />
    </nodes>
    <edges>
      <edge id="0" source="0" target="1" />
    </edges>
  </graph>
</gexf>
```

But a CSV table with network edges is the simplest

Daniil,Joanna,3

Joanna,Marco,15

Daniil,Marco,2

But a CSV table with network edges is the simplest. Here is what the CSV format accepted by Gephi looks like:

Source,Target,Weight

Daniil,Joanna,3

Joanna,Marco,15

Daniil,Marco,2

How do I obtain/produce such data?

There are graph datasets available in ready-to-use form:

- github.com/gephi/gephi/wiki/Datasets (datasets provided by the creators of Gephi)
- networks.skewed.de/ (a large repository of various networks — from dolphin friendships to Bitcoin transactions and scientific co-authorship)
- dracor.org (4330+ networks of theatre plays in 17 languages)

If you want to model your data as network on your own:

- First ask yourself, what is it you want to operationalize with a network
- Formalize the network for yourself:
 - What is a **node** (vertex) in our case?
 - What is an **edge** (connection)?
- Encode the edges in a machine-readable form — in other words, extract the network from a source (which can be text, historical objects, other types of sources, observations of life etc.)

Once you have a formalisation in your mind...
there are several ways to actually extract the
network

Many researchers build pipelines for automatically extracting networks from unstructured data

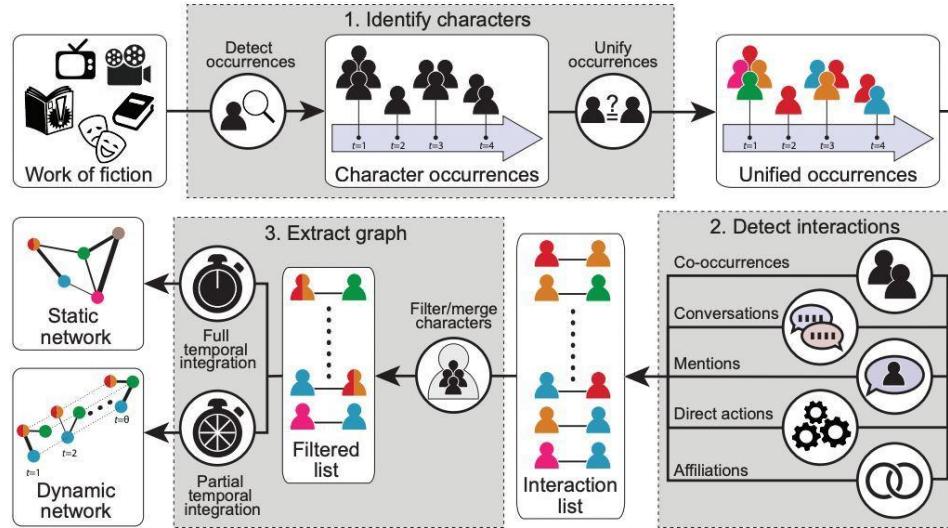


Fig. 1. Overview of the generic character network extraction process. Figure available at [10.6084/m9.figshare.7993040](https://doi.org/10.6084/m9.figshare.7993040) under CC-BY license.

Labatut, Vincent, and Xavier Bost. 2019. 'Extraction and Analysis of Fictional Character Networks: A Survey'. ACM Computing Surveys 52 (5): 1–40. <https://doi.org/10.1145/3344548>.

Many encode by hand in a spreadsheet or in [EzLinavis](#):

Easy Linavis

Examples ▾ Graph ▾ About

```
# 1st act
## 1st scene
Xanthias
Dionysus
## 2nd scene
Heracles
Dionysus
Xanthias
## 3rd scene
Dionysus
Xanthias
Xanthias
Corpse
## 4th scene
Charon
Xanthias
Dionysus
## 5th scene
Chorus of Frogs
Dionysus
## 6th scene
Charon
Dionysus
Xanthias
## 7th scene
Xanthias
Dionysus
Chorus of Blessed Mystics
## 8th scene
Chorus of Blessed Mystics
Xanthias
Dionysus
Chorus Leader
# 2nd act
## 1st scene
Dionysus
Xanthias
Aeacus
## 2nd scene
Maid-Servant
Chorus
## 3rd scene
Hostess
Plathane
Xanthias
Dionysus
## 4th scene
Chorus
Xanthias
## 5th scene
Aeacus
Dionysus
Xanthias
```

download CSV

Source	Type	Target	Weight
Aeacus	Undirected	Dionysus	2
Aeacus	Undirected	Xanthias	3
Aeschylus	Undirected	Chorus	6
Aeschylus	Undirected	Chorus Lead	6
Aeschylus	Undirected	Dionysus	6
Aeschylus	Undirected	Euripides	6
Aeschylus	Undirected	Pluto	2
Charon	Undirected	Dionysus	2
Charon	Undirected	Xanthias	2
Chorus Leader	Undirected	Chorus	
Chorus Leader	Undirected	Dionysus	
Chorus Leader	Undirected	Euripid	
Chorus Leader	Undirected	Xanthia	
Chorus of Blessed Mystics	Undire		
Chorus of Blessed Mystics	Undire		
Chorus of Frogs	Undirected	Diony	
Chorus	Undirected	Chorus Leader	
Chorus	Undirected	Dionysus	5
Chorus	Undirected	Euripides	5
Chorus	Undirected	Maid-Servant	1
Chorus	Undirected	Pluto	2
Chorus	Undirected	Xanthias	1
Corpse	Undirected	Dionysus	1
Corpse	Undirected	Xanthias	1
Dionysus	Undirected	Euripides	6
Dionysus	Undirected	Heracles	1
Dionysus	Undirected	Hostess	1
Dionysus	Undirected	Plathane	1
Dionysus	Undirected	Pluto	1
Dionysus	Undirected	Xanthias	10
Euripides	Undirected	Pluto	1
Heracles	Undirected	Xanthias	1
Hostess	Undirected	Plathane	1
Hostess	Undirected	Xanthias	1
Plathane	Undirected	Xanthias	1

The network graph displays nodes representing characters and scenes from the play. Nodes include Xanthias, Dionysus, Chorus, Aeschylus, Euripides, and others. Edges represent interactions between characters, with thickness indicating the weight of the connection. The graph shows a central cluster of nodes (Dionysus, Chorus, Xanthias) with many edges radiating outwards to other characters like Aeschylus and Euripides.

[ezlinavis manual](#)

Let us play around: ezlinavis.dracor.org

(you can also find it on dracor.org under ‘Tools’ menu)