

# BigDataFinance Winter School

## Network Analysis Tutorial

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### Overview

- Code on GitHub
  - <https://github.com/jbglattfelder/finexus/>
- Neo4j graph database
  - <http://neo4j.com> (version 2.3.8)
  - Embedded Java (Java 7)
    - \* Eclipse IDE (<http://www.eclipse.org/>)
  - Cypher
- Data
  - Bureau van Dijk's Orbis database
  - <https://orbis.bvdinfo.com/>
- Matlab

### Getting started

Get data from repository:

```
git clone https://github.com/jbglattfelder/finexus.git
```

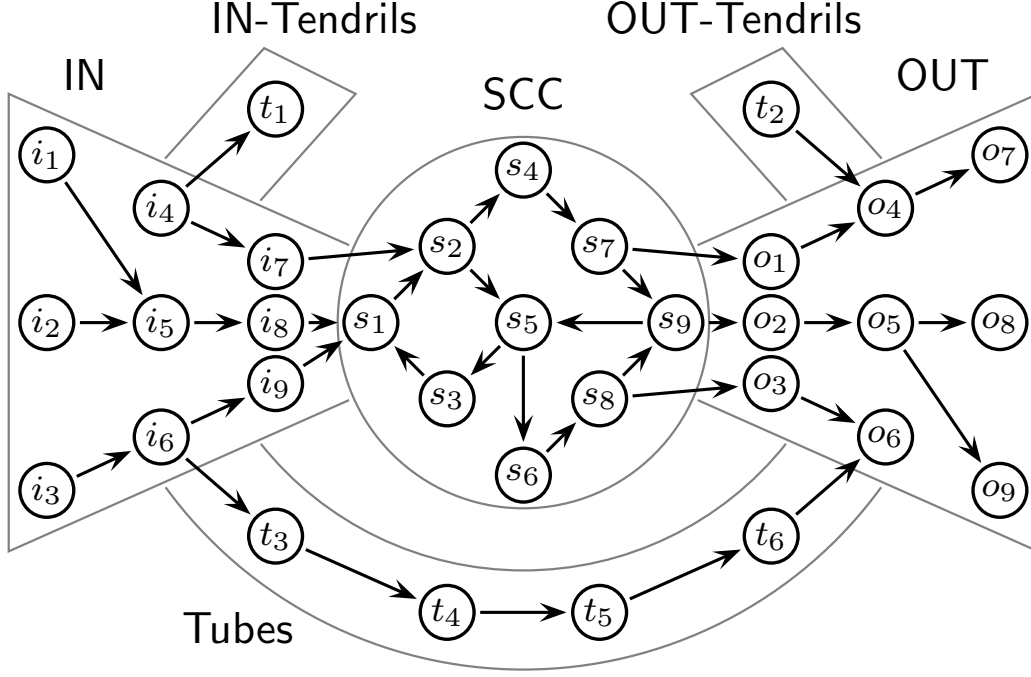


Figure 1: **Bow-tie network topology.**

The bow-tie example shown in Figure 1 is comprised of 27 nodes and 33 links. All incoming links are assumed to add up to 100% ownership, i.e.,  $\sum_j W_{ij} = 1$  and all incoming links have the same weight. This means that

$$\begin{aligned}
 W_{i_1 i_5} = W_{i_2 i_5} = W_{i_7 s_2} = W_{s_1 s_2} = W_{s_2 s_5} = W_{s_9 i_5} &= 0.5, \\
 W_{s_7 i_9} = W_{s_8 s_9} = W_{o_3 o_6} = W_{t_6 o_6} = W_{o_1 o_4} = W_{t_2 o_4} &= 0.5, \\
 W_{i_8 s_1} = W_{i_9 s_1} = W_{s_3 s_1} &= 0.3333,
 \end{aligned} \tag{1}$$

and for all other links  $W_{ij} = 1.0$ .