BigDataFinance Winter School

Network Analysis Tutorial

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- GitHub `https://github.com/jbglattfelder/finexus`
- Graph database: `http://neo4j.com` (version 2.3.8)
  - Embedded Java (Java 7)
  - Cypher
- Data: Orbis
- Matlab

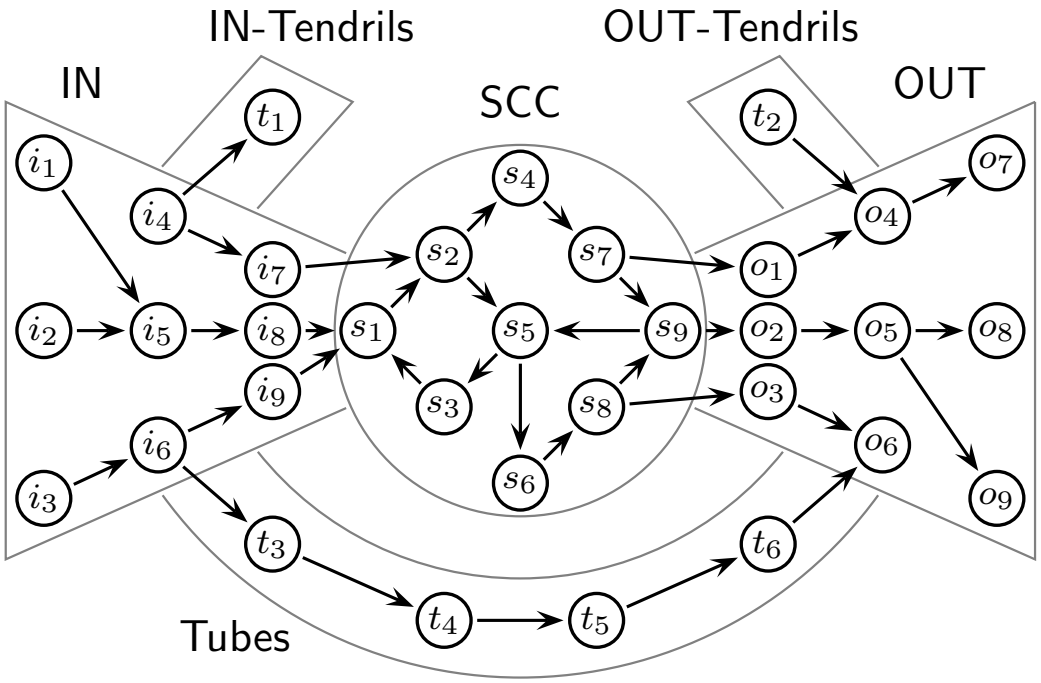

Figure 1: **Bow-tie network topology.**

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 $W_{ij} = 1.0$.