

## Answering legal research questions with network analysis

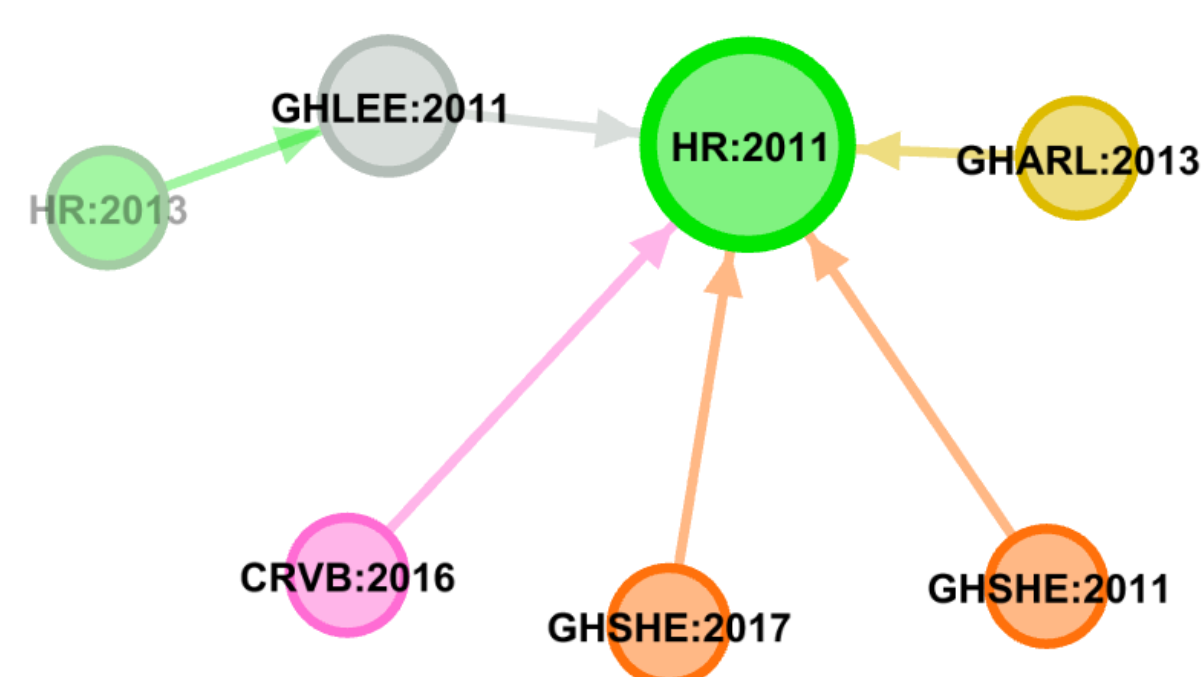
Dafne van Kuppevelt\*

### Introduction

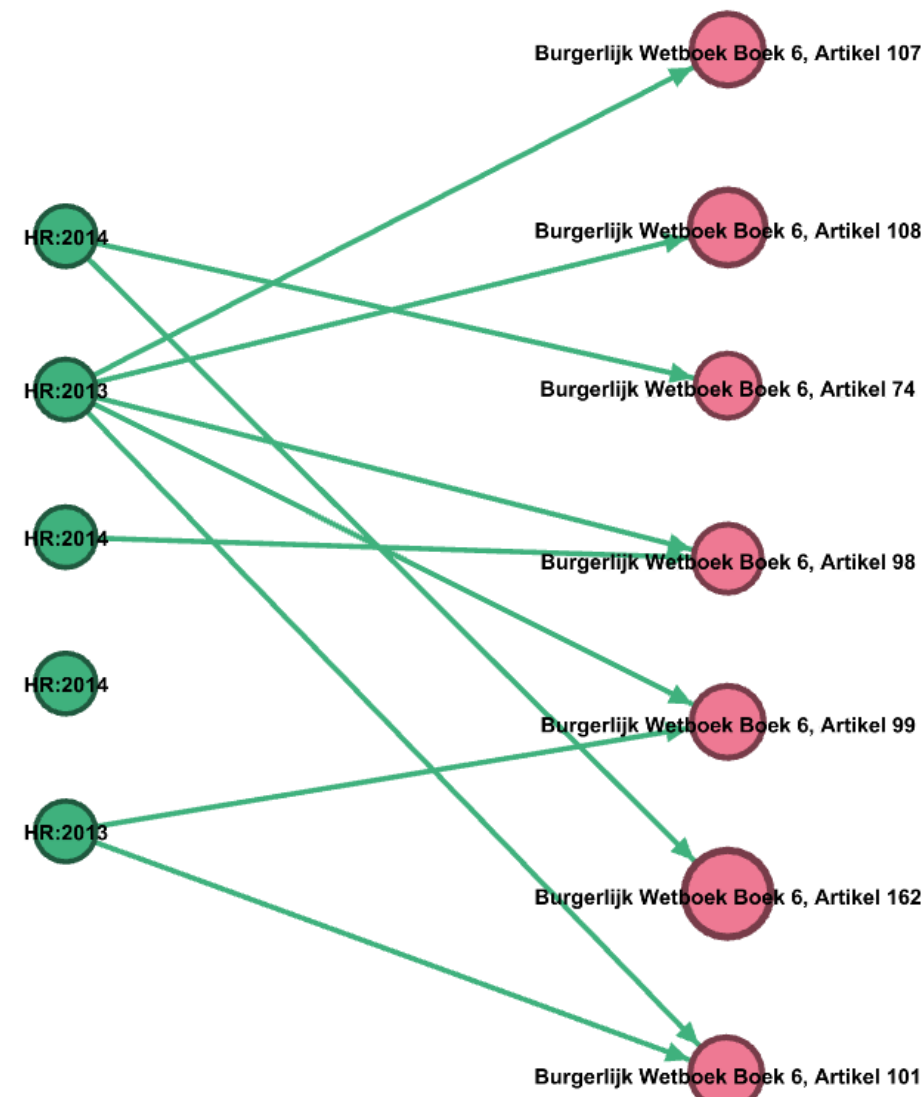
The availability of large collections of digitized legal texts provides an opportunity for **new methodologies in legal research** that enable large-scale analysis. In this work, we consider the body of legal decisions (case law) and legislation as a **citation network**. We present a **visualization tool** for legal researchers to explore and analyze the relationships in a dataset of Dutch case law. We also explore the application of **community detection** algorithms on legal networks to explain the structure of the legal domain.

### Representations

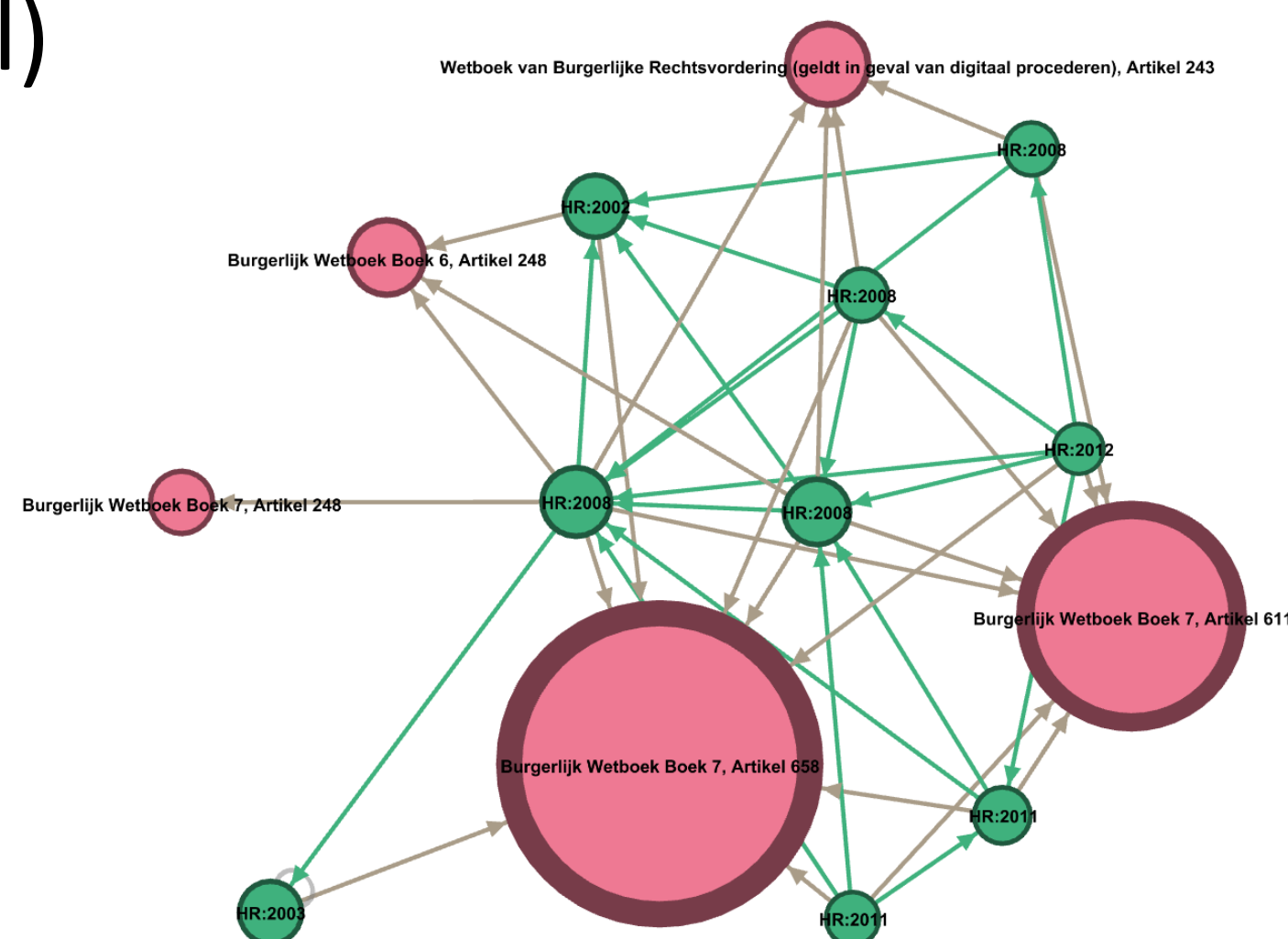
Case to case (directed acyclic)



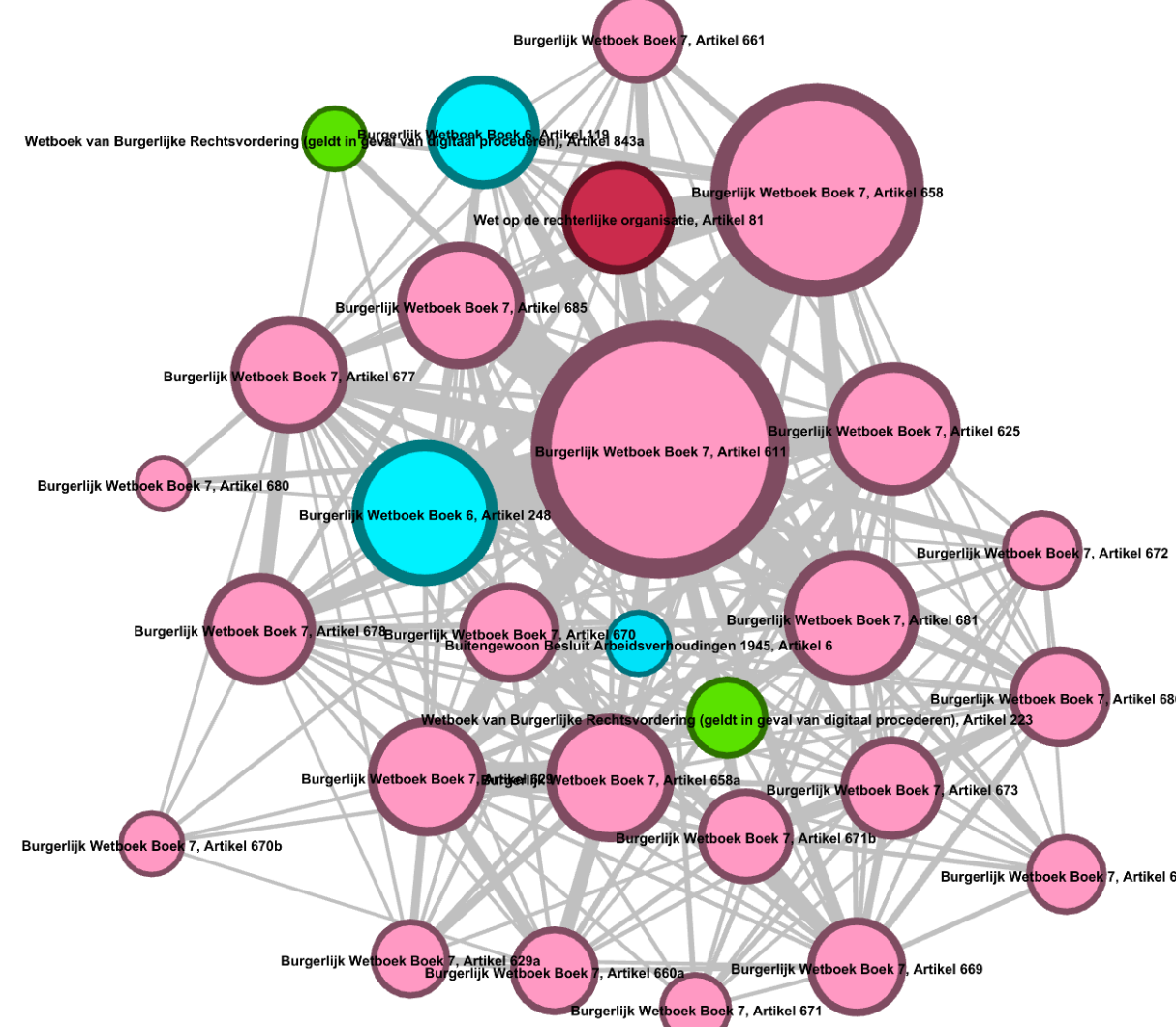
Case to article (bipartite)



Case to case and articles (directed, bimodal)

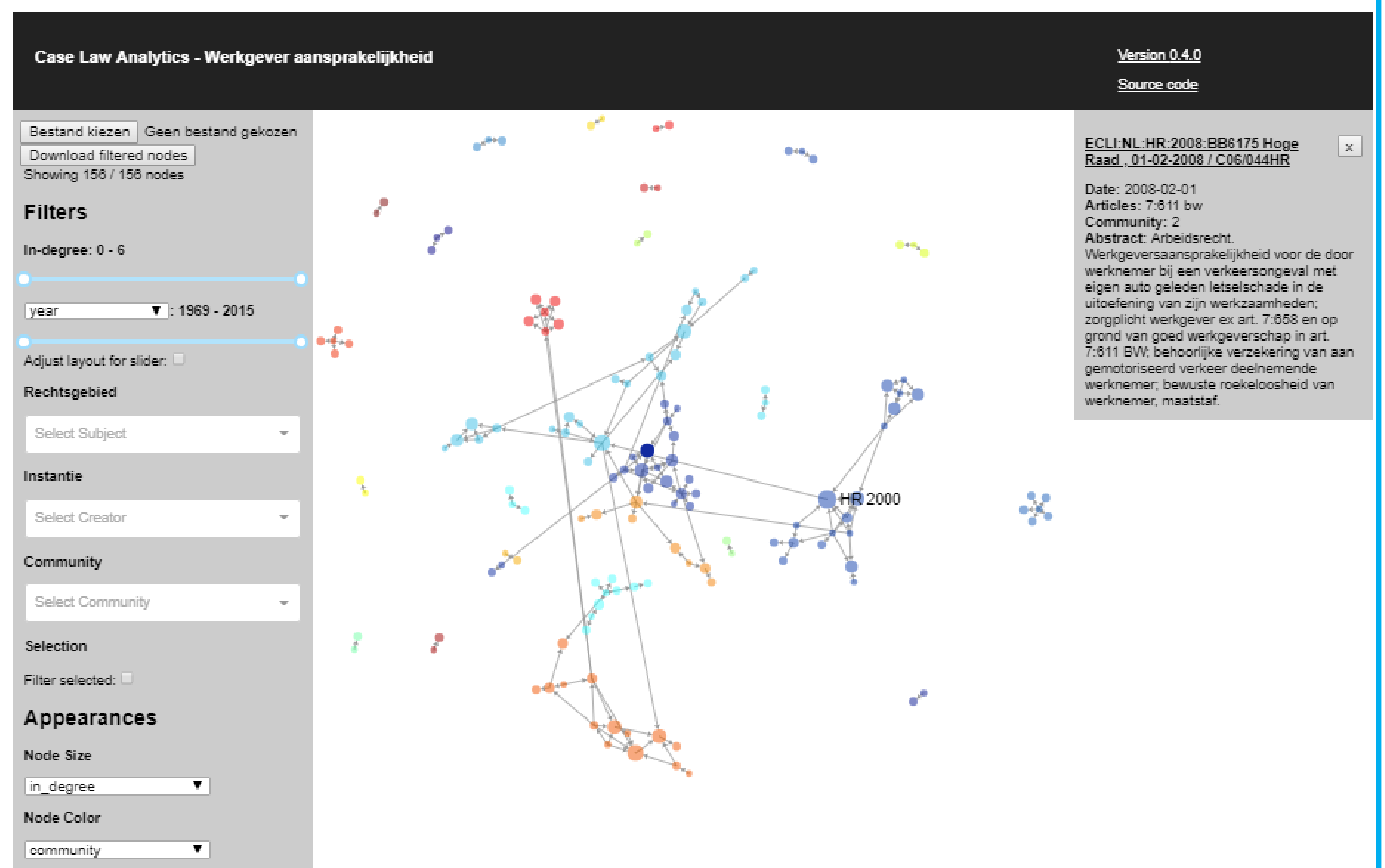


Legislation co-citations (undirected, weighted)



### Visualization tool (case law)

<http://nlesc.github.io/case-law-app>



### Community detection

- Modularity optimization) on legislation network
- 12,356 nodes, 142,081 links
- 278 communities, 100 in largest connected component
- (weighted) modularity of communities: 0.57
- The tool identified meaningful communities, e.g.: youth criminal law, extradition, traffic law
- Resolution limit problem: smaller communities are more interesting from the legal perspective (up to 3965 articles per community)

### Conclusion and future work

Network analysis and community detection are useful methodologies to get a quick insight in a legal dataset.

In future work, we will focus on **finding the right resolution** for legal communities and **exploring alternatives for modularity** for the directed network representations.

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