Informatics

Interactive Visual Exploration of Large Bipartite Graphs using Firework Plots

Katharina Unger
Visual Computing

TU Wien Informatics
Institute of Visual Computing & Human-Centered Technology
Research Unit of Computer Graphics
Supervisor: Ao.Univ.Prof. Dipl.-Ing. Dr.techn. Eduard Gröller
Assistant Supervisor: Univ.Ass. Dr.techn. Manuela Waldner, MSc
Contact: katharina.unger@inode.at

Motivation & Problem

· Interactive visualizations are important for exploratory data analysis
· Many interactive exploration tools for data experts already exist
· But often datasets are also of interest to a **broad audience**

Tools for domain experts only provide complex visualizations for experienced users and, therefore, are not suitable to develop insights for lay users.

Challenges

We propose a web-based interactive exploration interface for a broad audience to investigate large, weighted, bipartite graphs. To this regard, we focus on two challenges:

1 The analysis of web-based rendering technologies and their limitations
2 Development of an easily understandable visualization concept for lay users to visualize thousands of nodes and edges
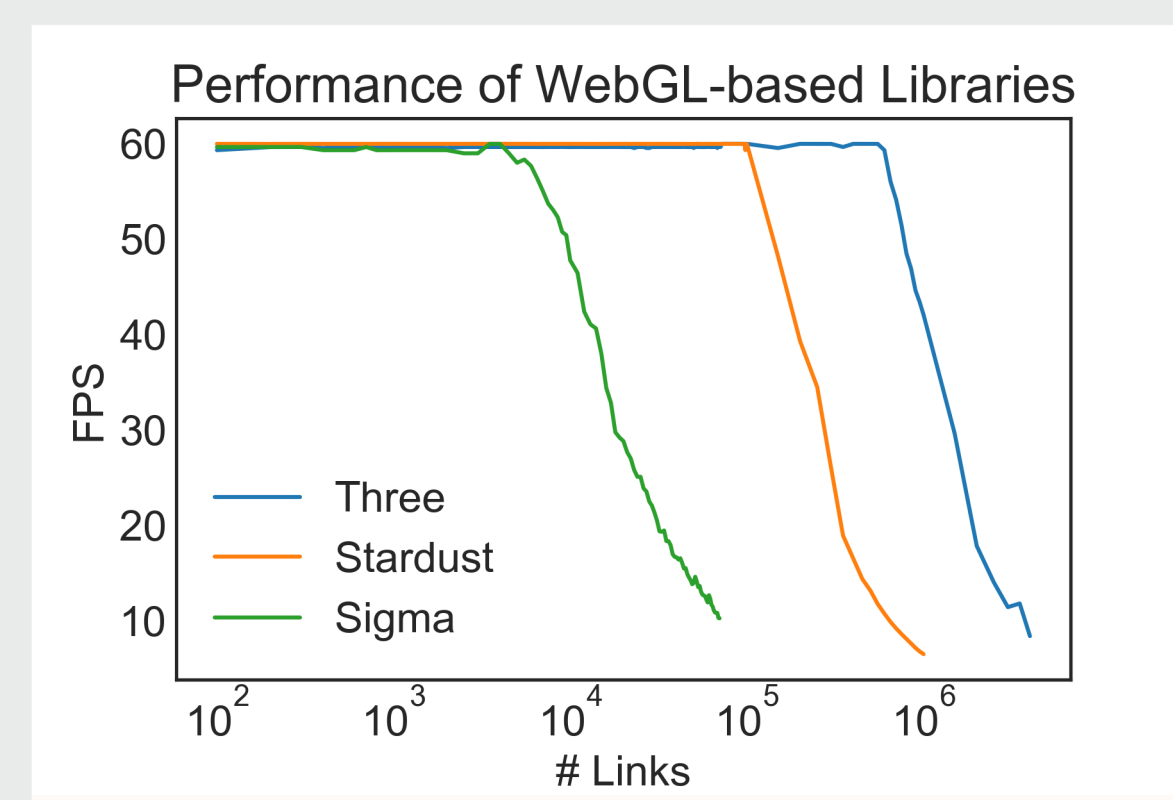
1 Rendering Technologies and their Limitations

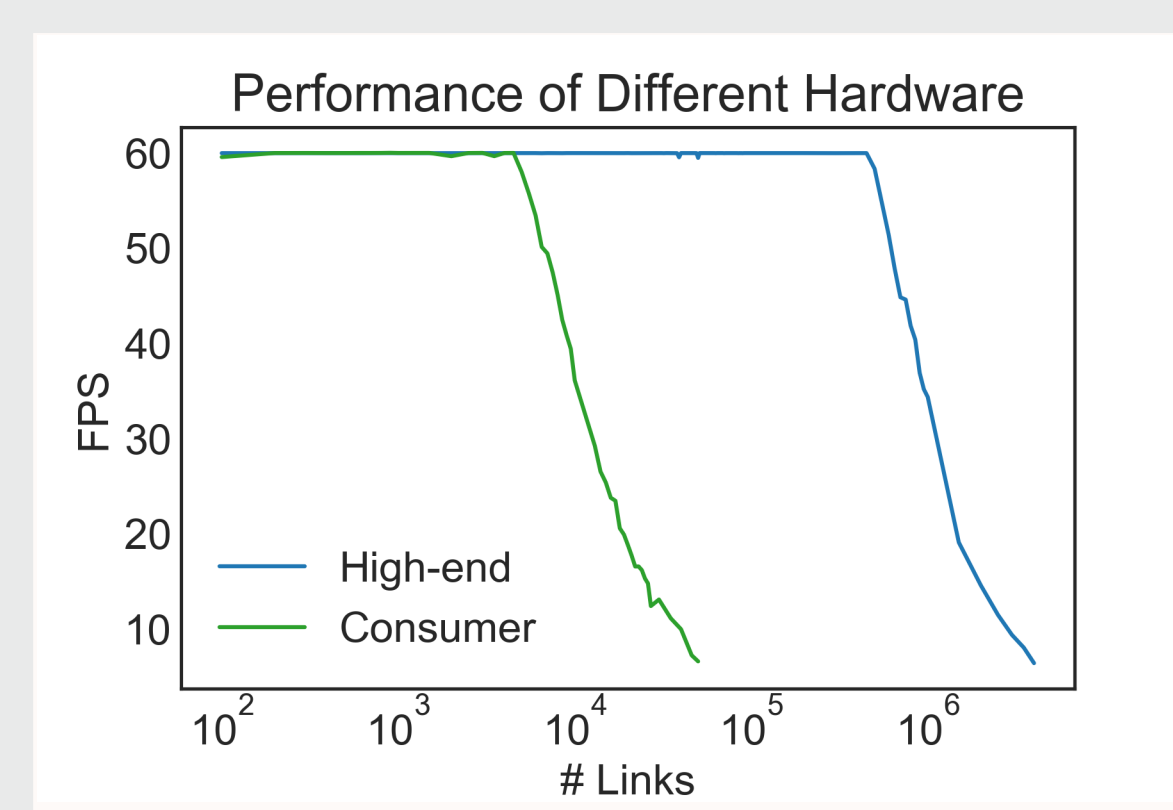State-of-the-art of web-based rendering technologies: SVG, Canvas, WebGL
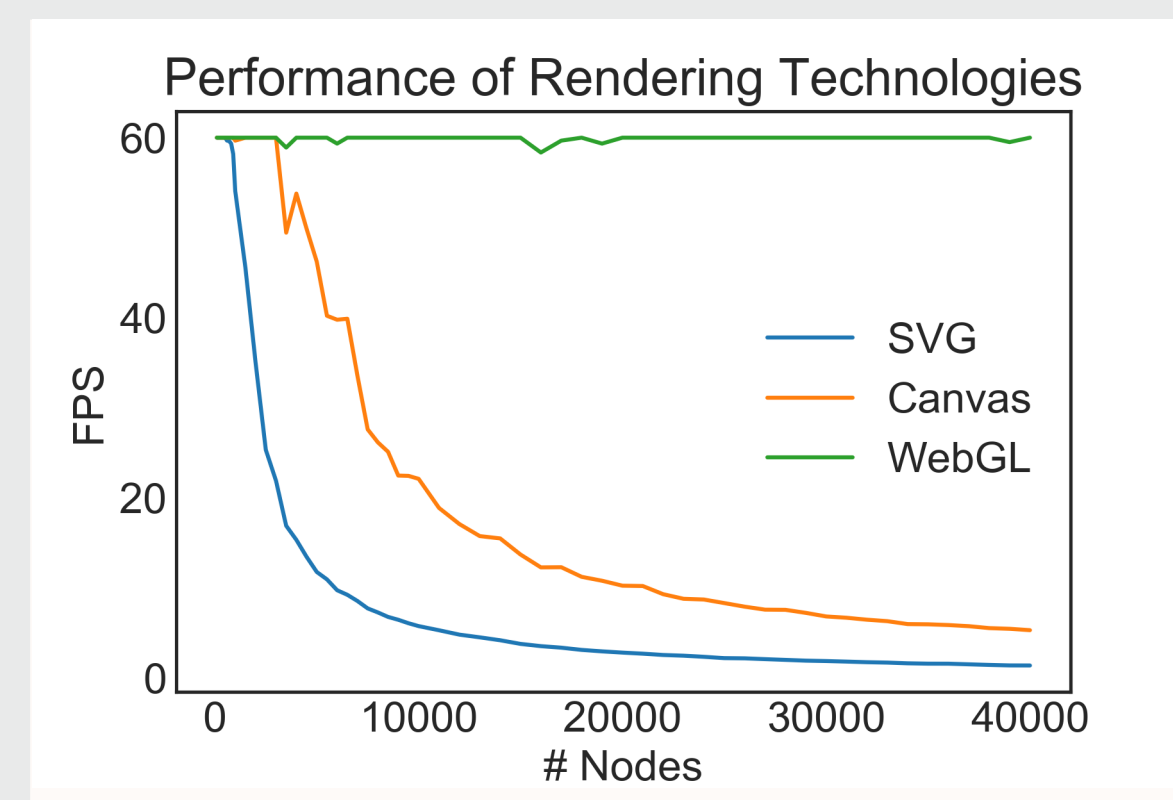
use **WebGL** library

WebGL-based Libraries
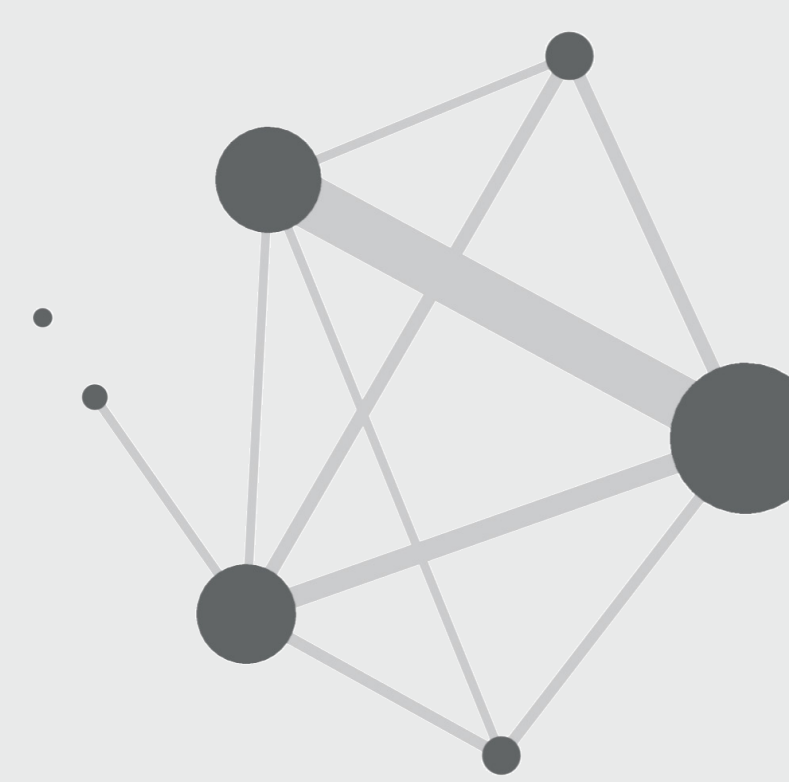

limitations: graph with **<10^6 links**
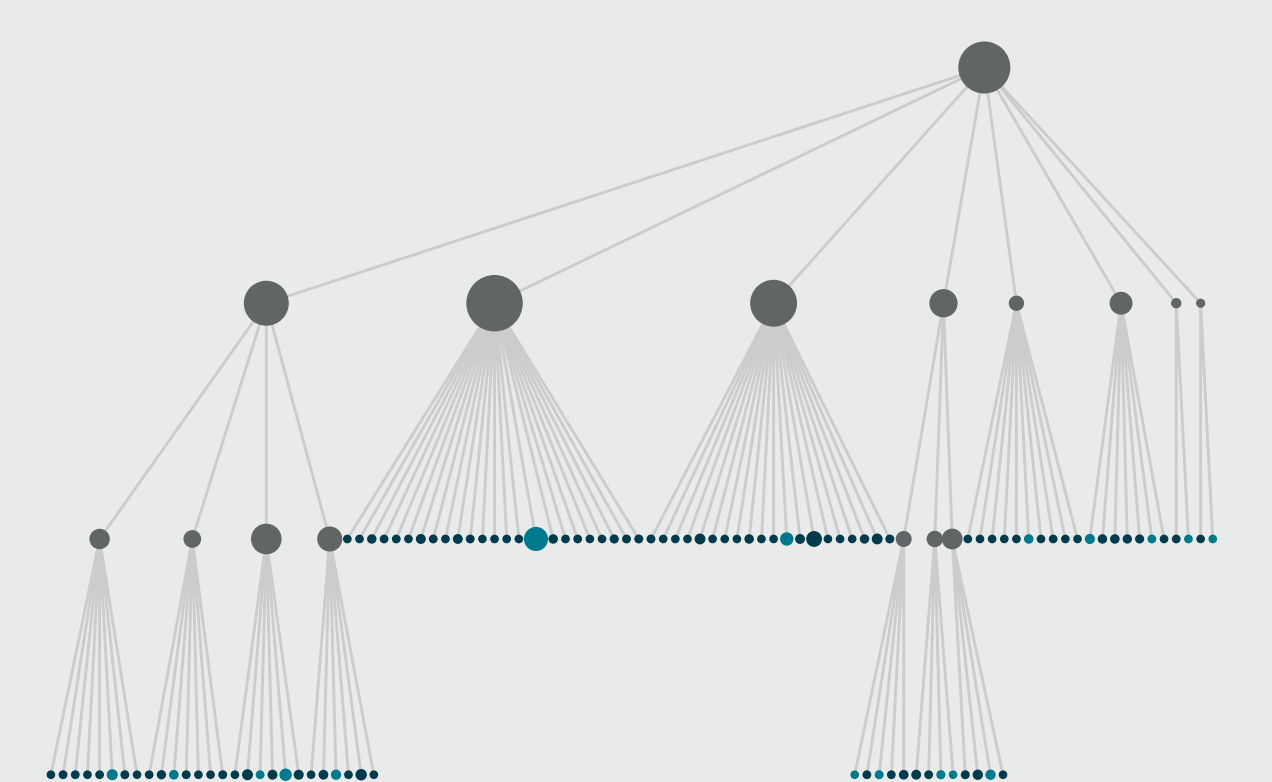
Consider consumer hardware!

limitations: graph with **<6000 links**

2 Visualization Concept: Firework Plots

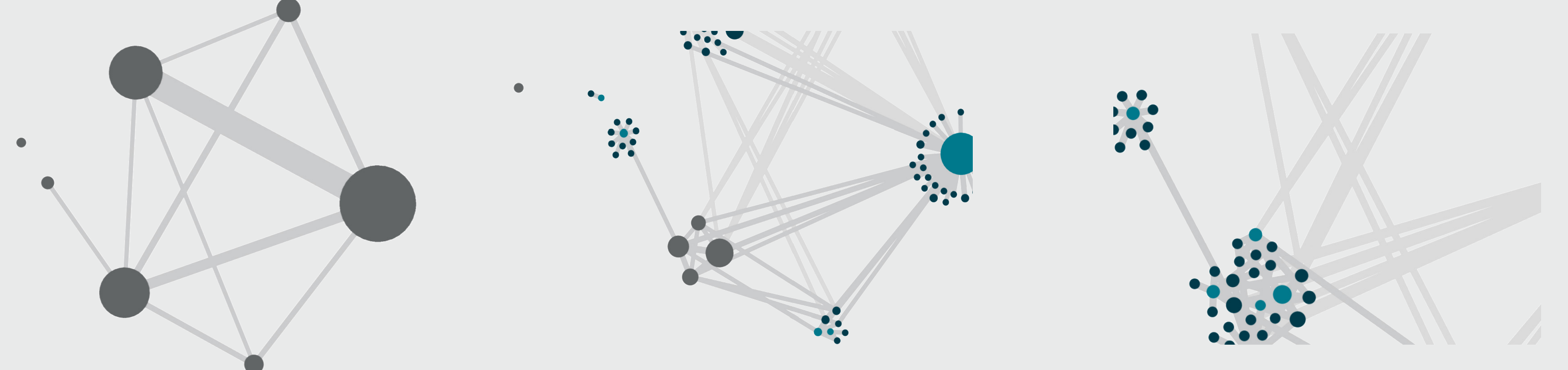· well-known visualization: **node-link diagrams**

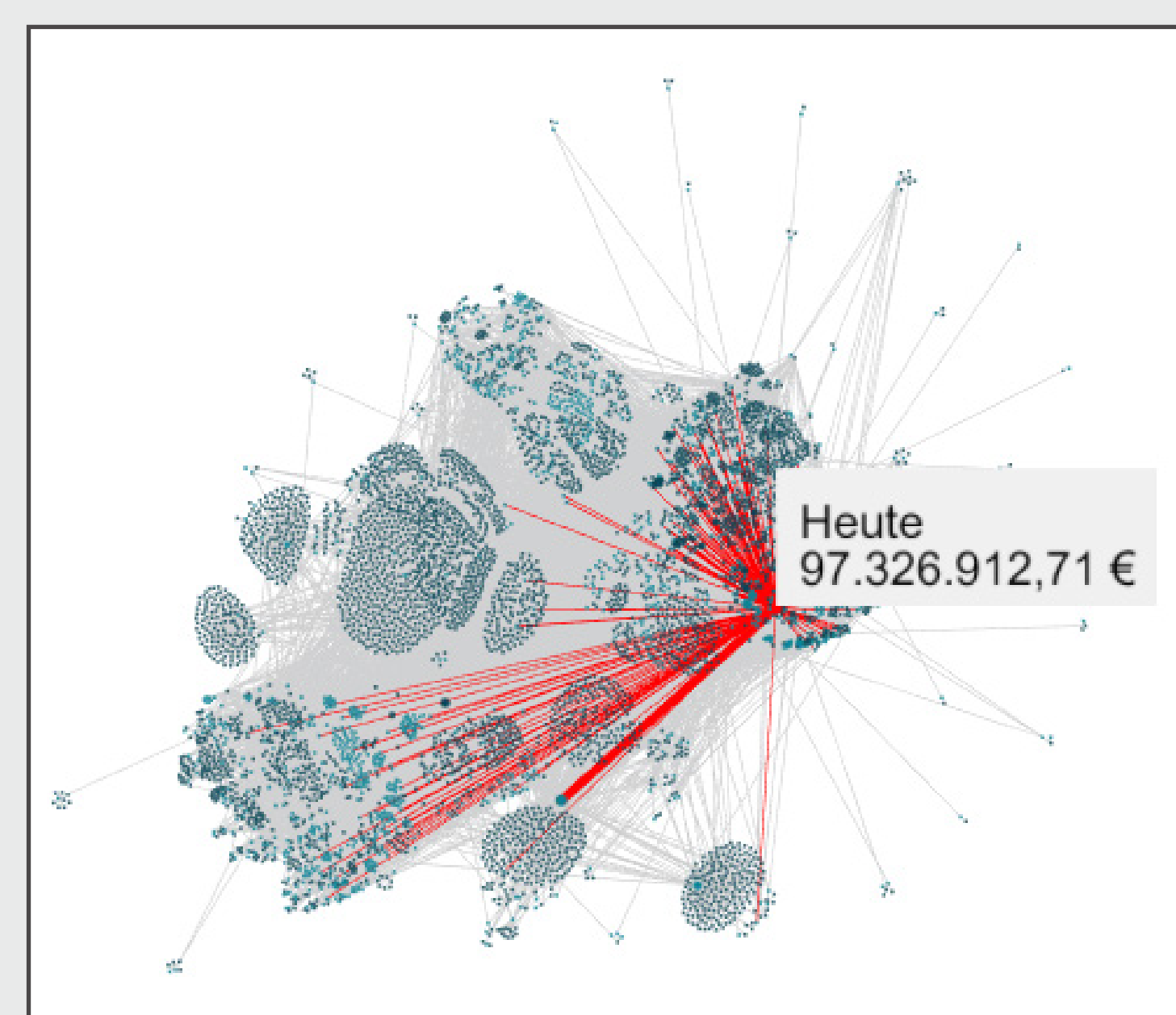· overcome scalability issues: **hierarchical clustering**
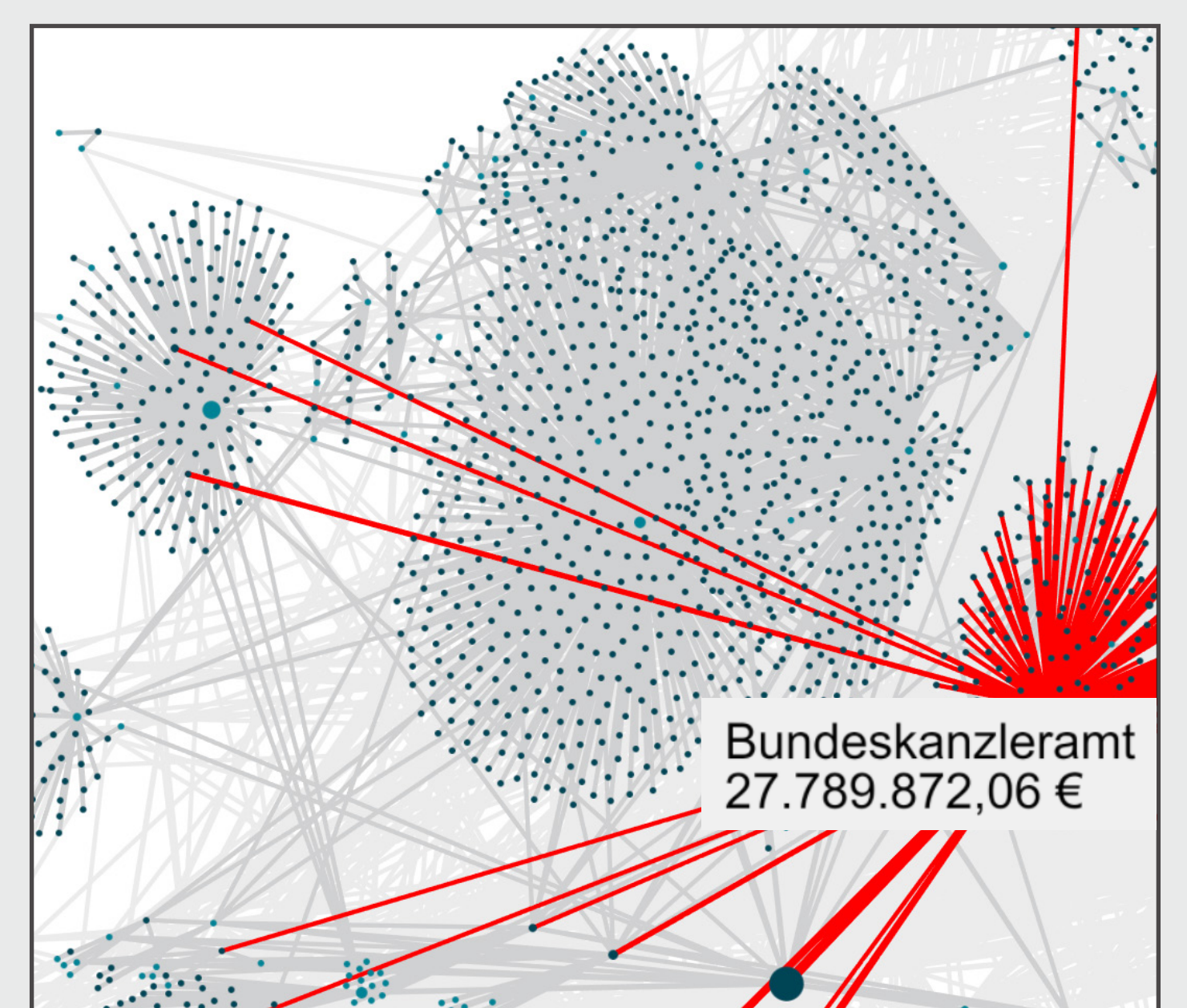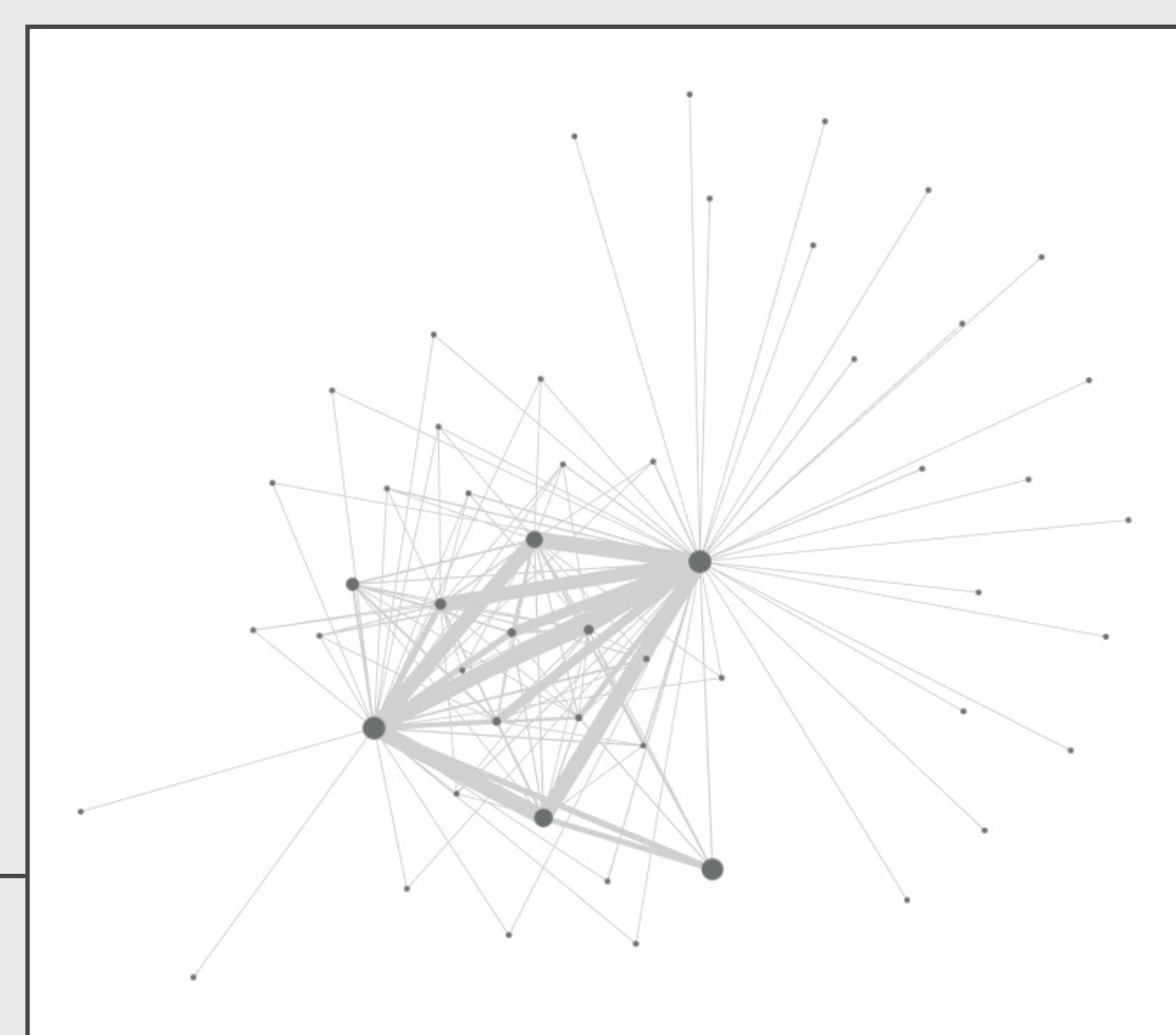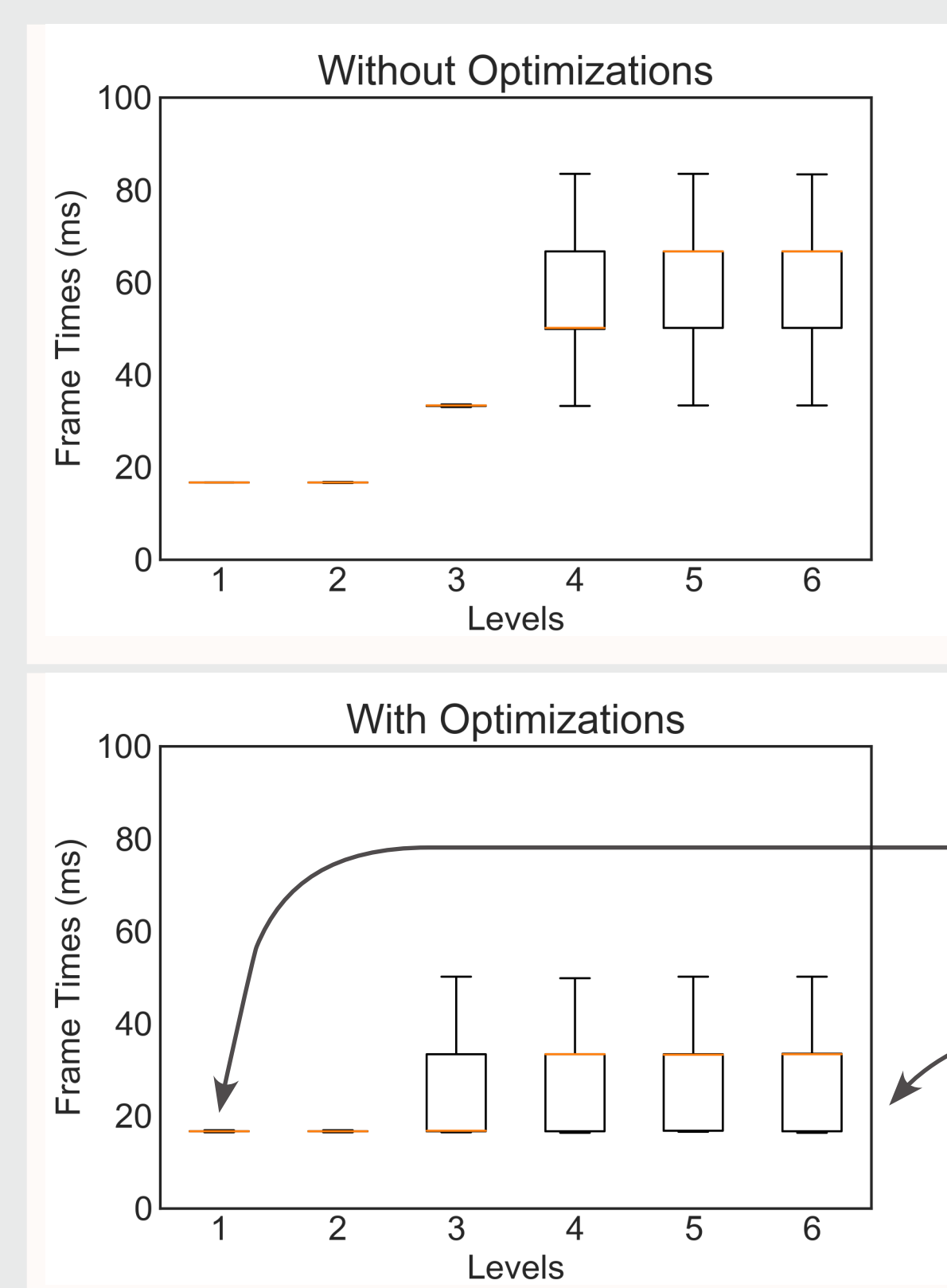

· **constrained layered force-based layout**

· drill-down the hierarchy: **seamless zoom**

Results

Media Transparency Database 2012 - 2019
5925 nodes & 17780 links
https://www.rtr.at/de/inf/odMTGDaten

Firework Plots provide easily understandable visualizations and halve the frame times.
https://users.cg.tuwien.ac.at/kunger/da-bipartite-node-link/?data=MTD-20123-20194