

N17 Soltani, K., & Diesner, J. (2014). Improved visualization of multi-mode networks that entail geo-coded entities.

Visualizations of geo-coded networks are essential for exploring and understanding patterns of relationships between places or locations and other types of entities, e.g. social agents or information. The growing availability of big and thick geo-coded network data as well as improvements in online mapping technologies have made spatial network visualization one of the most common web-based visualization applications. Existing network visualization techniques imply the assumption that network data can be divided into two groups: first, networks where some geographical information is given for every node, e.g. transportation networks. In this case, after processing geo information, we can simply plot nodes on a map. Second, networks where no node has geographical information, e.g. co-authorship networks. In this case, networks are visualized according to alternative layout algorithms such as spring embedders. However, many real-world networks fall right in between: they entail some nodes for which geographical information is available and relevant, e.g. places that people have visited, and other nodes for which geographical information is irrelevant, such as peoples' knowledge and emotions. We are presenting a novel framework and implementation (GeoXViz) that addresses this issue by effectively visualizing semi-spatial networks. We plot geo-tagged nodes on a map and then use a label propagation-based method to assign multiple locations to each non-location nodes with their corresponding assignment strength. Then we produce a word cloud for each geo-tagged node after identifying the importance of its associated nonlocations using meta-data weighting techniques (e.g. tfidf). This solution provides an intuitive visualization with details-on-demand functionalities per location.