# Visualizing Influence of Authors in Citation Networks

## Literature Survey

The visualization of the citations networks has been gaining a lot of attention from the researchers as it can help in identifying important research papers in the fields, identifying scholarly communities and assessing the impact of disciplines and other fields. [1], [4] and [6] are some of the research papers that deal with this topic using different datasets. In this research project, we intend to analyze a related question that what is the impact of an author on the scholarly literature across the disciplines. This question has not been addressed with the same attention and detail as compared to the other questions related to the Citations Networks Analysis. Though there are ways and metrics to assess the influence of the authors on the field and across the fields but just like any other network visualization the citations network visualizations need to make sure that the visualization is expressing the importance of each nodes and edge in the network effectively. As such the decisions related to the visualizations become very important. For example, if every citation of a paper is shown on the network then it can result in a cluttered map like the one shown in [3] which is much cluttered.

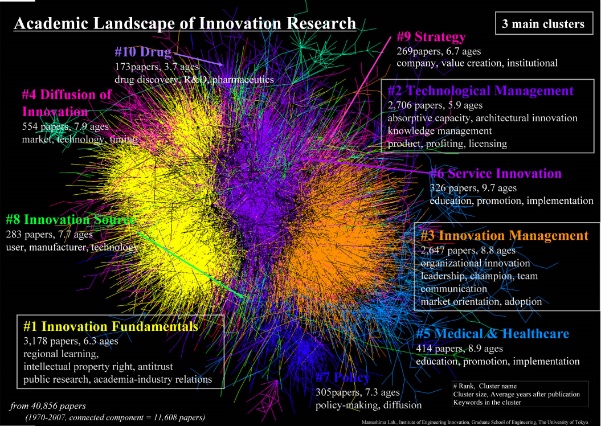


Figure 1 Basic Visualization of Citation Networks [3]

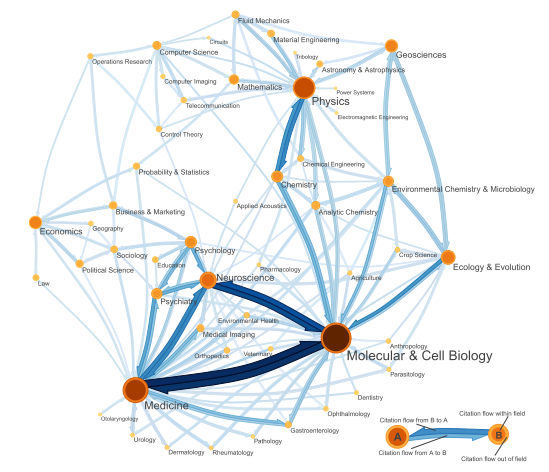
Rosvall and Bergstrom have tried to identify the community structure in the citation networks [1], but the visualizations chosen by them maps the citations from one discipline to another and within the discipline very well. However, they are different from our project in the sense that their focus is on the influence of the citations of the whole field rather than the individual authors. To some extent, the authors’ visualizations may be considered to be the macro level visualizations while our aim in this project is to come up with the visualizations that can show the influence of the individual authors on the field at the micro level.

Figure 2 A Map of Science based on Citation Networks [1]

Some of the visualizations decisions used by Rosvall and Bergstrom are visually very intuitive. For example, node size indicates the citation flow with in the network while the ring color width indicates the citation flow outside the networks. We intend to use some of these concepts in our work as well. An extension of the research work in [1], West et al. have tried to evaluate the influence of the authors, institutions and countries on the fields in [2] but their work is more inclined towards the ways and metrics to evaluate the scholarly influence rather than the visualization of the influence. In this project, we want to extend the work in [1] and [2] and visualize the impact of the authors on scholarly literature in a field. Dunne et al have used a force-directed approach to layout papers such that similar papers are close to each other [4]. The papers are shown as rounded rectangles with color coding by their statistical rankings and the spline arrows showing their citations. Communities with in the citation networks are shown in the convex hulls. The concept of the Transitive reduction of citations mentioned in [5] can be used to make sure that the edges in the citation network that are not carrying a lot of information can be eliminated.

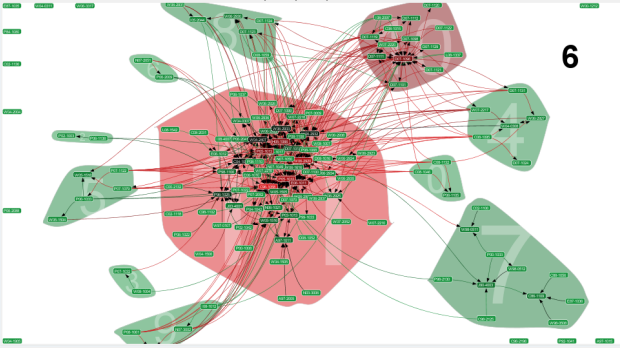


Figure 3 Citation Network Statistics and Visualizations [4]

# References

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