Original Abstract

Network visualization is a fundamental part of social network analysis. As one of the first things we are taught, visualizing social networks (and networks in general) can be informative and exciting. We introduce the R programming package netplot for network visualization. netplot provides out-of-the-box high-quality graph visualizations. It was designed with the primary goal of creating beautiful figures with minimal effort. netplot provides a flexible way to personalize network drawing by allowing the user an extensive array of graphical parameters.

Netplot was designed on top of 'The Grid Graphics Package,' the same powering the popular R package ggplot2. netplot provides automatic vertex scaling, full-screen mode, edge color mixer, and low dependency footprint among its main features. To date, this R package has over 6,000 downloads. This poster project will showcase its usage and the new features implemented in the University of Utah's "Summer Program for Undergraduate Research (SPUR)." We will present an application of netplot to two different types of epidemiological datasets: one with multiple networks and another with a single large graph. The first dataset features interactions between patients and providers in long-term healthcare facilities in the Veterans Affairs (VA) system. This bipartite graph contains multiple vertex classes, including the type of healthcare professional and the patient's health condition. The second example will depict the usage of the package in a large inferred transmission network of COVID-19. With it, we will illustrate the capabilities of netplot to handle large network data, which can often be challenging to manage. Both examples will highlight netplot's features and best practices for network visualization.

Updated Abstract

This abstract presents the outcomes of a summer research project conducted as part of the Summer Program for Undergraduate Research (SPUR) at the University of Utah. The project aimed to explore and enhance netplot, an advanced network visualization tool in the R programming package, and its applications in social network analysis.

netplot, a powerful R package, enables high-quality and aesthetically pleasing graph visualizations. Leveraging 'The Grid Graphics Package' from ggplot2, netplot offers automatic vertex scaling, full-screen mode, edge color mixing, and minimal dependencies, providing a user-friendly and flexible platform for generating stunning visual representations of data.

The research encompassed two phases. In the first phase, a comprehensive presentation was prepared to highlight netplot's capabilities and effective utilization. With over 6,000 downloads to date, netplot's success and popularity in the scientific community were evident. The project conducted experiments and case studies using various datasets, including those from the University of Utah, showcasing netplot's real-world applications and recent improvements.

During the second phase, efforts were dedicated to enhancing netplot's usability and documentation. A detailed paper for potential publication discussed the technical aspects of the package and emphasized its significance in addressing contemporary challenges in social network analysis. The documentation was improved to provide clear explanations of parameters, enabling informed decisions for tailored visualizations.

The research also focused on identifying and summarizing graphing algorithms compatible with netplot, enhancing the package's versatility for different network data types. An extensive literature review was conducted, highlighting key aspects for future advancements in graph creation and network visualization.

In conclusion, the SPUR program's summer research project underscored netplot's significance as an indispensable network visualization tool and substantially contributed to its growth and enhancement. The comprehensive case studies and experiments showcased netplot's impressive capabilities, solidifying its position as a versatile and user-friendly package for social network analysis and beyond.