Matrix Methods for Social Network Analysis Data: Practical Applications of Excel

Presenter: Nicole C. Fernandez, MS Mathematics and Statistics

Software Requirements: Participants should have Excel available on the laptops they bring for this tutorial. Examples and practice problems will be distributed in an Excel file with multiple sheets and a PowerPoint will also be distributed. While not required, participants will be able to work along with the examples shown on their laptops.

Description:

This tutorial focuses on how Excel can be used to manage and explore Social Network Analysis aata while filling in analytic gaps not currently available in the free visualization software NodeXL Basic.

Participants will learn how to code a directed and undirected adjacency matrix and generate appropriate degree metrics. This will be followed by the strategic task of determining Neighborhood Overlap for a pair of nodes by using custom sort within the matrix.

Eigenvector Centrality will be briefly introduced. Participants will then learn how to calculate the total number of connections within two steps from a particular node while avoiding double counting. This task will be accomplished with a multidirectional custom sort.

A brief introduction to matrix multiplication will be presented to facilitate discussion of how the square of an adjacency matrix should be interpreted. This will allow students to generate a 'Local Bridge Finder' matrix consistent with the definition presented in Networks, Crowds and Markets. The value of identifying these types of connections will be emphasized while cautioning about the limitations of missing data. Using powers 1 to n-1 for the ARPANET data participants will also learn how to use a nested if command to output a full distance matrix for a network.

Finally, a brief introduction to unimodal conversions of an affiliation matrix will be presented.