Geo-spatial and Temporal Analytics and Visualization for Networks

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Network analytics are widely used in many fields. Increasingly though, the networks of interest vary through time or need to be understood from a spatial perspective. Making network science actionable typically involves answering questions about where the network is concentrated or how the network varies over time. This tutorial will cover the basics of visualizing and analyzing time varying networks and spatially positioned networks.

Description: A lecture and hands-on workshop in which attendees learn how to visualize and analyze temporal, geo-located and geo-temporal networks. Attendees will learn how to visualize networks on maps, assess spatial nearness, visualize change in networks, detect change in networks, and compare networks from multiple time periods. Participants will be walked through the visualization and analytic processes using the ORA toolkit. Participants will be able to use a trial PC version of ORA. Those with macs should have a PC emulator. Sample data sets will be available.

This session begins with an overview of importing spatial and/or temporal network data. Visual analytics for placing networks on 2D and 3D maps, networks as trails, trails on maps, time stepping through networks will be covered. Change detection and Fourier analysis for time varying networks will also be discussed. Standard approaches for comparing time periods and trends in networks will also be addressed.

Who Should Attend? Those who are interested in assessing networks that have a temporal component and spatial component. The material and its delivery is suitable for researchers and practitioners, alike. This is designed to be a non-technical workshop; however, by its very nature, the material will involve some mathematics, although this will be minimized as the delivery is driven towards forming an understanding of the concepts, not mastery of the details.

Topics Include:

- Dynamic Network Analysis
- Comparing and contrasting networks
- Change Detection
- Fourier Analysis for networks
- Visual Analytics
- ORA software
    - Geo-spatial and temporal visualization and analysis

Computer Equipment:

The trial version of ORA is only available for the windows operating system. Prior to the workshop all attendees will be sent an access key to the software and associated data sets. The professional version of ORA and the mac version are available here: http://netanomics.com/ora-pro/ . Participants should bring their own laptops to workshop. If you have a mac version, you will need to have a PC emulator. The software will be screen-projected to the group as a live walk-through demonstration. Participants will be provided with data through a web link. All participants will also be given a SBP-BRiMS 2017 discount on purchasing the professional version of ORA which is available for both MACs and PCs.

Maximum Number of Attendees: Unlimited