

Visualizing Temporal Social Networks in Context – Adding Content Analysis to TeCFlow

Peter A. Gloor, Yan Zhao

MIT Center for Coordination Science, Center for Digital Strategies at Tuck at Dartmouth

We have extended TeCFlow [1], a tool for the temporal visualization and analysis of social networks, to visualize content in its temporal context. TeCFlow creates interactive dynamic movies of relationships. It now combines visualization and analysis of the evolution of social networks over time with visualization and analysis of the evolution of semantic networks (concept maps [2]). It shows synchronized changes in central positions of social actors and core concepts over time.

The TeCFlow term view analyzes temporal text to identify the leading themes or concepts based on the vector space information retrieval model [3]. It identifies themes by clustering previously unconnected statements and documents. Active relationships between concepts are displayed in a sliding time window, with inactive relationships decaying over time. TeCFlow also calculates and plots the evolution of group betweenness centrality, density, and contribution index of concepts over time to discover changes in interesting concepts in the lifetime of a collection of documents.

TeCFlow takes as input structured and unstructured data such as the Web, Google search results, email logs, phone archives, Intranets, and plain documents. It allows, for example, combining tracking the changes in social structures in an e-mail network with visualizing the central concepts discussed in the e-mails. Another application is combining the link structure of Web documents, where changes in the network of Web links are visualized over time, with tracking changes in contents of the Web documents. TeCFlow offers unique capabilities to display and identify unfolding relationships, be they people, words or concepts.

References:

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- [3] Li, Y.H. Jain, A.K. Classification of text documents, The Computer Journal, Volume 48, No 8, pp. 537-546. 1998