Defining and Using Types
of Relationships in Social Networks

CARSTEN KEßLER
University of Münster, Germany
Email: carsten.kessler@uni-muenster.de

My interest in the specialist meeting on spatio-temporal constraints on social networks is in the interaction between the relationships between real-world interactions and online social networks. I am particularly interested in how those real-world relationships can act as the grounding for social networks. Evidently, key relationships—such as best friends—are often reflected in current social networks, yet hard to distinguish from other, potentially loose contacts in a user's social network. Hence, there seems to be a mapping mechanism form real-world to online relationships, where some information is lost on the way. This loss is partly caused by the implementation of the social networks, which only allow for certain, fixed types of relationships. Spatio-temporal relationships between users, combined with other information (message exchange, participation in events, etc.) could be used to disambiguate these relationships. In order to do so, the following research questions need to be dealt with:

1. *What is the ontology of relationships in online social networks?* We need an understanding of the different types of relationships that can be found in online social networks, independent of the actual implementation. The spatio-temporal aspects of these user type definitions can act as anchors when mapping from the real-word to online social networks, and between different networks.
2. *What information is lost when going from real-world to online relationships?* Social networks typically only allow for very coarse distinction between types of contacts. Evidently, this results in a loss of information, as the diverse types of relationships between people are reduced to a small number of online contact types. Vice versa, some online relationships do not have a correspondency in the real world. Defining the offset between offline and online networks will allow us to understand the information loss when mapping one to the other, and give us clues on how space and time can be used to refine the mappings.
3. *How can real-world identities allow us to translate between different social networks?* Identity is an inherently spatio-temporal concept, as any member of a social networks is somewhere during some activity within the network. The number of online communities that allow users to disclose their current location is rapidly growing. Location information thus becomes an important indicator for the integration of different online social networks, which is required for a higher-level, implementation-independent analysis.

4. *How can spatio-temporal media be used in this process?* Geotags have become standard metadata in photo communities, and their use is constantly increasing as more and more cameras and mobile phones are equipped with GPS chips. More recently, social networks enabled users to tag people in their uploaded pictures, who can be unambiguously identified via their ID or URL within the network. Together, these pictures allow for the detection of collocation of users at a certain point in time, which could be used to further disambiguate the relationships within network and develop a more fine-grained classification.

5. *How can such information be used in online communities?* Trust and reputation are currently being investigated as proxies for data quality for collaboratively generated content; in [1], we have discussed this issue for a community-generated gazetteer. However, the degree to which findings on trust and reputation from the social sciences [2] translate to online communities largely defines how useful they will be as proxies for data quality. A more detailed understanding of the mapping process (see question 2) is required to judge the practicability of such approaches.

Insights on these questions bear great potential to improve online interaction, especially when users collaboratively create content. Privacy, however, is an obvious issue in such research. What we can infer from social networks should therefore not only be explored from an academic perspective, i.e., what we can learn from the massive datasets collected by online social networks, but also with the ethic implications in mind. Particularly, it should be discussed what kinds of conclusions the operators of such social networks can draw on a larger scale, having access to all data of all users.

References

C. Keßler, K. Janowicz, and M. Bishr. An Agenda for the Next Generation Gazetteer: Geographic Information Contribution and Retrieval. In GIS '09: *Proceedings of the 17th ACM SIGSPATIAL International Conference on Advances in Geographic Information Systems*. Seattle, Washington, pages 91–100, New York, NY, USA, 2009. ACM.

P. Sztompka. *Trust: A Sociological Theory*. Cambridge University Press, Cambridge, 1999.