An application area of increasing importance is creating agent-based simulations to model human societies. One component of developing these simulations is the ability to generate realistic human social networks. Online social networking websites, such as Facebook, Google+, and Twitter, have increased in popularity in the last decade. Despite the increase in online social networking tools and the importance of studying human behavior in these networks, collecting data directly from these networks is not always feasible due to privacy concerns. Previous work in this area has primarily been limited to 1) network generators that aim to duplicate a small subset of the original network’s properties and 2) problem-specific generators for applications such as evaluations of community detection algorithms.

In this thesis, we extended two synthetic network generators to enable them to duplicate the properties of a specific dataset. In the first generator, we consider feature similarity and label homophily among individuals when forming links. The second generator is designed to handle multiplex networks that contain different link types. We evaluate the performance of both generators on existing real-world social network datasets, as well as comparing our methods with other proposed synthetic network generation methods. In this thesis, we demonstrate that the proposed synthetic network generators are both time efficient and require only limited parameter optimization.

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The public is welcome to attend.