This dissertation focuses on two important studies of social networks: protecting privacy of individuals in publicly available social network data and simulating online user activity in various social media platforms. The first study was motivated by the access and privacy issues of social network data due to the sensitive information they capture. We present a data-driven framework to measure privacy and utility on network data and demonstrate its applicability via extensive experiments on real world social networks. The second study aims to accurately model the information dissemination in social media across various contexts. In this line of work, we propose a data-driven model that forecasts groups of topic-related, overlapping, online conversation trees on Reddit. We improve this model to generate Twitter activity related to a political crisis using signals from contemporary exogenous data, such as news articles and Reddit.

**Publications**
1. Horawalavithana, S., NG, K. and Iamnitchi A. Drivers of Polarized Discussions on Twitter during Venezuela Political Crisis, 13th ACM Web Science Conference (WebSci), Southampton, UK, 2021 (To Appear)
4. Horawalavithana, S., NG, K. and Iamnitchi A. Twitter is the Megaphone of Cross-Platform Messaging on the White Helmets, International Conference on Social Computing, Behavioral-Cultural Modeling, & Prediction and Behavior Representation in Modeling and Simulation (SBP-BRiMS), DC, 2020

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