Computational Approaches to Social Modeling (ChASM) 2014

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Program & Abstracts

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Program

Time		Duration
10.00-13.00	Session 1	3h
13.00-14.30	Lunch break	1h30m
14.30-16.00	Session 2	1h30m
16.00-16.30	Coffee break	30m
16.30-18.00	Session 3	1h30m

Overview

- 10 Regular talks of 15m each
- Q&A at the end of each session
- 4 Invited talks of 40m each
- 5m of Q&A at the end of each invited talk

Sessions

10.00-13.00 – Session 1 (3h)

Time	
10.00-10.10	Opening remarks
10.10-10.55	Invited talk #1: Y.Y. Ahn
10.55-11.10	Arnim Bleier, Haiko Lietz and Markus Strohmaier. *Consensus Formation in Social Networks through Iterated Learning*
11.10-11.25	Ying Chen, Andreas Frei and Hani Mahmassani. *An Exploration of Attitude Diffusion Mechanisms in a Social Network*
11.25-11.40	Abdullah Almaatouq, Fahad Alhasoun and Anas Alfaris. *Reaction of Human Communities to Impulsive External Perturbations*
11.40-11.55	Alireza Abbasi. *Measures for weighted networks: hybrid centrality metrics*
11.55-12.40	Invited talk #2: Ciro Cattuto
12.30-13.00	Open discussion

13.00-14.30 – Lunch break (1h30m)

14.30-16.00 – Session 2 (1h30m)

Time	
14.30-15.15	Invited talk #3: Brian Keegan
15.15-15.30	Daniele Quercia, Rossano Schifanella and Luca Maria Aiello. *Shortest Urban Paths or Shortcuts to Happiness?*
15.30-15.45	Ryan Compton, Jiejun Xu and Matthew Keegan. *Inferring the geographic focus of online documents from social media sharing patterns*
15.45-16.00	Jared Lorince and Peter Todd. *Identifying Canonical Music Listening Patterns on Last.fm*
16.00-16.15	Alexander Barron, Giovanni Ciampaglia, Emilio Ferrara and Alessandro Flammini. *Price, popularity, and growth dynamics of Bitcoin*
16.15-16.30	Open discussion

16.00-16.30 – Coffee break (30m)

16.30-18.00 – Session 3 (1h30m)

Time	
16.30-16.45	Rachael Fulper, Giovanni Luca Ciampaglia, Emilio Ferrara, Filippo Menczer, Yong-Yeol Ahn, Alessandro Flammini, Bryce Lewis and Kehontas Rowe. *Misogynistic Language on Twitter and Sexual Violence*
16.45-17.00	Jana Diesner, Amirhossein Aleyasen, Shubhanshu Mishra, Aaron Schecter and Noshir Contractor. *Comparison of explicit and implicit social networks constructed from communication data*
17.00-17.45	Invited talk #4: Filippo Radicchi
17.45-18.00	Final discussion

Abstracts

Session 1

Arnim Bleier, Haiko Lietz and Markus Strohmaier.

Consensus Formation in Social Networks through Iterated Learning

Time: 10.55-11.10

Abstract: Agent-based simulations have become a popular tool in understanding the relationship between assumptions on the micro-level and emergent macro-level properties of social dynamics. However, work on the relationship between agent-based simulations and Bayesian inference has been fairly limited and is seldom directly applied to the simulation of social systems itself. In this paper we phrase a classic simulations scenario of social dynamics as a Bayesian model of iterated learning. Moreover, we report on applications of this model to the simulation of consensus formation on political opinion in a network of politicians on Twitter.

Ying Chen, Andreas Frei and Hani Mahmassani.

An Exploration of Attitude Diffusion Mechanisms in a Social Network

Time: 11.10-11.25

Abstract: The objective of this research is to present a model of social network-based attitude diffusion in the context of activity and travel choice behavior. The principal mechanisms that contribute to attitude formation are first identified, and then mathematical models are developed to capture these processes. The primary contributions of this research are (1) modeling attitude diffusion according to social and learning mechanisms and (2) the evolution of these attitudes over time in a lattice neighborhood social network. The agent-based framework presented is sufficiently general and flexible to allow building a more complete representation of information diffusion and attitude formation within activity and travel behavior choice dimensions, e.g. mode choice or departure time choice. The framework allows extending the presented approach with additional social network structures, information sources and social interaction mechanisms in the physical and virtual realms or extending and modifying the presented approach to simulate the impact of information-based management strategies.

Abdullah Almaatouq, Fahad Alhasoun and Anas Alfaris.

Reaction of Human Communities to Impulsive External Perturbations

Time: 11.25-11.40

Abstract: In this work, we propose to study the communication dynamics and information propagation of real-world emergencies through contact networks of mobile phone users and social mediums. Previous studies have shown that these `bread-crumbs' of digital traces can act as in situ sensors for human behavior; allowing for quantifying social actions and conducting social studies at an unprecedented scale. However, much of the efforts in utilizing such proxies focused on the study of human dynamics under regular and stationary situations, leaving the quantitative understanding of impulsive human behavior under extreme events an under studied chapter. In this work, we show that human communications are both temporally and spatially localized during such emergencies. In addition, we discuss and address future research directions.

Alireza Abbasi.

Measures for weighted networks: hybrid centrality metrics

Time: 11.40-11.55

Abstract: A method used to understand networks and their participants is to evaluate the location of actors in the network. Measuring the network location is about determining the centrality of an actor. These measures help determine the importance of a node in the network. This research proposes new hybrid centrality (collaborative) measures for a node in weighted networks in three different categories: First category of measures only considers a node's neighbors' degree; Second category of measures takes into account the links' weights of a node in a weighted network; and Third category of measures combines both neighbors' degree and their links' weight. Using a co-authorship network, the association between these new measures and the existing measures with scholars' performance is examined to show the applicability of the new centrality measures. The analysis shows that the scholars' citation-based performances measures are significantly associated with all the proposed centrality measures but the correlation coefficient for the ones based on average indicators (i.e, a-Degree and Aw-Degree) is the highest.

Session 2

Daniele Quercia, Rossano Schifanella and Luca Maria Aiello.

Shortest Urban Paths or Shortcuts to Happiness?

Time: 15.15-15.30

Abstract: When providing directions to a place, web and mobile mapping services are all able to suggest the shortest route. At times, however, when visiting a friend, we do not necessarily take the fastest route but might enjoy alternatives that, for example, offer beautiful urban sceneries. We have recently started to work on a framework that automatically generates routes that are not only short but also emotionally pleasant (e.g., that are happy). To quantify the extent to which urban scenes are pleasing, this framework uses a crowd-sourcing web platform that shows two street scenes of a city and let users vote on which one looks more beautiful, quiet, and happy. Such crowd-sourced ground truth allows us to build a graph of locations, weighted by the pleasantness scores, upon which pleasant routes can be extracted. We have initially applied this framework in the context of London and have obtained promising preliminary results.

Ryan Compton, Jiejun Xu and Matthew Keegan.

Inferring the geographic focus of online documents from social media sharing patterns

Time: 15.30-15.45

Abstract: Determining the geographic focus of digital media is an essential first step for modern geographic information retrieval. However, publicly-visible location annotations are remarkably sparse in online data. In this work, we demonstrate a method which infers the geographic focus of an online document by examining the locations of Twitter users who share links to the document. We apply our geotagging technique to multiple datasets built from different content: manually-annotated news articles, GDELT, YouTube, Flickr, Twitter, and Tumblr.

Jared Lorince and Peter Todd.

Identifying Canonical Music Listening Patterns on Last.fm

Time: 15.45-16.00

Abstract: We describe ongoing work to identify canonical patterns of music listening on the social music platform Last.fm, presenting our method for clustering a large sample of listening time series and preliminary results. We also discuss the relationship between listening and tagging behavior, and the implications of this work.

Alexander Barron, Giovanni Ciampaglia, Emilio Ferrara and Alessandro Flammini.

Price, popularity, and growth dynamics of Bitcoin

Time: 16.00-16.15

Abstract: Bitcoin is a digital cryptographic currency system that has received large media attention as both a legitimate method of payment and an enabler of unlawful marketplaces such as the Silk Road. It also offers an unparalleled opportunity to study the evolution of a financial system thanks to the availability of all transaction records since its inception [2]. Here we investigate how price, volume of transactions, influx of users, and interest towards Bitcoin are related. However, two of the features that make Bitcoin popular — decentralization and anonymity — make it difficult to identify the financial actors in the system. For this reason, much research has focused on breaking its anonymity [3]. Here we adopt a simple entity resolution method to extract a proxy for financial actors. Our method allows us, among other things, to extract patterns of wealth accumulation of single entities and to monitor when new actors enter the system. We show that the price of Bitcoin is highly correlated with the influx of new actors. This suggests that price fluctuations may be driven by demand from newcomers, even though the amounts involved in such transactions are generally small, compared to the overall exchange of wealth in the system. Interestingly, price fluctuations are much less correlated with other readily available, and arguably relevant signals, such as the number or volume of daily transactions. Possible scenarios compatible with the observed trend are that Bitcoin is increasingly seen as a viable investment tool, or as an efficient and secure payment system. We also test the hypothesis that Bitcoin adoption and price are correlated to its increasing media exposure. To this purpose we show that the number of requests to the "Bitcoin" entry on Wikipedia is correlated over time with both price and number of new actors entering the system, suggesting a link between popularity and price. The plot below shows new entity participation, Wikipedia page requests, and price aggregated on a daily basis for 2013. Price peaks correspond to peaks in Wikipedia page requests and new actors participation. Our work could pave the way towards a better understanding of how abnormal price fluctuations, bubbles, flash crashes, and long-term trends are linked to the availability and consumption of information, and how microscopic behavior of actors affects, and is affected by, price dynamics [4, 5, 1]. Bitcoin offers, in this respect, the unprecedented opportunity of tracking, modeling, and price, predicting individual actors.

Session 3

Rachael Fulper, Giovanni Luca Ciampaglia, Emilio Ferrara, Filippo Menczer, Yong-Yeol Ahn, Alessandro Flammini, Bryce Lewis and Kehontas Rowe.

Misogynistic Language on Twitter and Sexual Violence

Time: 16.30-16.45

Abstract: Studies have demonstrated that social media may offer insights into social behaviors. Here we investigate the potential of social media in predicting criminal behavior, in particular rape and sexual abuse. Traditional approaches for studying sexual violence are effective but laborious, although often limited to small sample sizes and coarse temporal resolutions. Additionally, the sensitive nature of sexual violence and stigmas against victims result in serious under reporting of rape crime statistics. The factors contributing to rape are not fully agreed upon, but research shows that the acceptance of, and willingness to commit rape are highly correlated with sex-role stereotyping, rape myth beliefs, and misogyny. Here we explore whether social media can be used as an indicator of sexual violence in the US, by tracking misogynistic tweets. We compared the number of tweets and rape crime statistics for each state, and found a significant association. Our work paves the way to the design of a 'social sensor' system to detect rape and other abuse by monitoring social streams.

Jana Diesner, Amirhossein Aleyasen, Shubhanshu Mishra, Aaron Schecter and Noshir Contractor.

Comparison of explicit and implicit social networks constructed from communication data

Time: 16.45-17.00

Abstract: Social networks can be constructed from explicit information about who is talking to whom, and/ or inferred from the content of communication. How do the resulting network structures compare? We provided an answer to this question by constructing explicit social networks from chat logs and comparing them to implicit social networks built from text data generated by these agents. We apply different conceptualizations of similarity to the text data. This work helps to understand if explicit social networks (what people typically work with) can serve as a proxy for the true structure of communication networks. Our findings suggest that the more simplistic approach on the lexical level outperforms the more complex, topic based approach. This means that reconstructing social networks based on lexical features is the best option tested, while detecting alternative and additional latent structures of people sharing the same topical knowledge requires looking for thematic clusters of word use.