NLP and Computational Social Science – An Emerging Trend

Rationale – In the last decade we have witnessed the birth and rapid growth of Wikipedia, Google, Facebook, YouTube, Twitter, and numerous other marvels of the digital age. In addition to changing the way we live, these tools---and the technological revolution they are a part of---have fundamentally changed the way we learn the social world. Digitalisation is rapidly changing the ways social science is being researched. The change is no longer about how we research the digital realm, but more and more about the new viewpoints we are able to get on the society as a whole. Social Science is on the verge of a paradigm shift that allows us to ask and answer questions that were unthinkable a few decades ago. We can now collect data about human behavior on a scale never before possible and with tremendous granularity and precision. The evolution of social media has created not only many new opportunities for information access, but also many new challenges, leading to one of the prime research areas nowadays. Different research communities such as physicist, mathematicians, computer scientists have been addressing the problem in isolation; however joint effort for this kind of inter-disciplinary areas is needed. Therefore, Computational Social Science has been emerging as an independent research problem.

Computational social science, mostly deals with data-driven understanding of complex social networks, which often requires knowledge about graph analysis, data mining, natural language processing and machine learning. Therefore, this tutorial is formed around following four major topics which fall under the emerging field of computational social science: Psychology and Sociology, Natural Language Processing, Complex Network, Big Data and Machine Learning.

This is a half-day tutorial. The tutorial will cover the following topics.

- Sociology: Small World networks & properties
- Complex Network Basics – Centrality measures, Betweenness, Reciprocity
- Understanding Societal Sentiment
- Understanding the notion of Social Communities

- The Information Diffusion Process- Who is Mentioning Whom?
- Understanding the psycho-sociological influences of Optimism / Pessimism

In the last half an hour of the tutorial, we will discuss about open research problems.

- Understanding Psycho-Sociological Vulnerability of ISIS Patronizers in Twitter – To stop ISIS recruitment
- Detecting and disabling Twitter BOT

BRIEF BIO AND RESEARCH INTERESTS

- **Amitava Das:** Presently Dr. Amitava Das am working as an **Assistant Professor** in the department of Computer Science & Engineering at the IIIT Sri City, Andhra Pradesh, India. He has experienced two academic postdocs: in Europe and in the USA. In the USA I worked as a **Research Scientist** with Prof. Rodney Nielsen in the Human Language Technologies (HiLT) lab at the University of North Texas, USA. During summer 2014 I worked at James Pennebaker's lab, the University of Texas-Austin as an **Invited Researcher**. Earlier, he spent one year working as a European Research Consortium for Informatics and Mathematics (ERCIM) **Post-Doctoral Fellow** at the Norwegian University of Science and Technology (NTNU), Norway. He has also worked for industry. Before moving to the USA, he worked for Samsung Research India, Bangalore as a **Chief Engineer**. He has obtained Ph.D. (Engineering) from Jadavpur University, India. During his doctoral study, he worked for an Indo-Japan collaborative project entitled "**Sentiment Analysis where AI meets Psychology**" with the Tokyo Institute of Technology, Japan.

Web Page: http://amitavadas.com/

- **Tanmoy Chakraborty**: Tanmoy Charaborty is currently an Assistant Professor at IIIT Delhi, India. He completed his Ph.D as a Google India Ph.D. fellow in the Dept. of CSE, IIT Kharagpur, India in Sept, 2015. Afterwards, he spent around one and half years at University of Maryland, College Park, USA as a postdoctoral researcher. His Ph.D. thesis has been recognized as the best Ph.D. thesis by Xerox Research India and IBM Research India. He has also received INAE doctoral level innovation student project award, best paper runner up in ASONAM'16, best poster award in Microsoft TechVista'15. His primary research interests include Computational Social Science, Data Mining and Data-driven cybersecurity. He has served as a PC member in various top conferences including AAAI, PAKDD, IJCAI, and reviewer of top journals including ACM TKDD, IEEE TKDE, ACM TIST, CACM. He is also co-organizer of two workshops – TextGraphs-10 (NAACL'16) and SMERP (ECIR'17).

Website: https://www.iiitd.ac.in/tanmoy