The Geospatial Information Sciences
Program
Presents

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Date: October 31, 2014 (1:30pm – 2:30pm)
Location: GR 3.606  (Light lunch will be served from 1pm – 1:30pm)

The Role of Modern Social Media Data in Surveillance and Prediction of Infectious Diseases: from Time Series to Networks

Abstract:
The prompt detection and forecasting of infectious diseases with rapid transmission and high virulence are critical in the effective defense against these diseases. Despite many promising approaches in modern surveillance methodology, the lack of observations for near real-time forecasting is still the key challenge obstructing operational prediction and control of disease dynamics. For instance, even CDC data for well monitored areas in USA are two weeks behind, as it takes time to confirm influenza like illness (ILI) as flu, while two weeks is a substantial time in terms of flu transmission. These limitations have ignited the recent interest in searching for alternative near real-time data sources on the current epidemic state and, in particular, in the wealth of health-related information offered by modern social media. For example, Google Flu Trends uses flu-related searches to predict a future epidemiological state at a local level, and more recently, Twitter has also proven to be a very valuable resource for a wide spectrum of public health applications. In this talk we will review capabilities and limitations of such social media data as early warning indicator of influenza dynamics in conjunction with traditional time series epidemiological models and with more recent random network approaches accounting for heterogeneous social interaction patterns within a GIS framework.

About the speaker:
Yulia R. Gel is an Associate Professor at the Department of Mathematical Sciences of the University of Texas at Dallas and Department of Statistics and Actuarial Science of the University of Waterloo, Canada. She got her MSc and PhD degrees in Mathematics from Saint-Petersburg State University, Russia. She also held visiting positions at the University of Washington, University of California, Berkeley, and Johns Hopkins University. Her main research interests stem around time series analysis, space-time processes, random networks and nonparametric statistics, with applications ranging from weather forecasting to risk assessment due to climate change and spatio-temporal surveillance of infectious diseases. She is a Fellow of the American Statistical Association and is Treasurer of the International Environmetrics Society (TIES).