

Large scale graph analytics for anomaly detection & description

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Anomaly mining is the task of finding irregularities in large complex datasets and finds a plethora of applications in security, finance, astronomy, biology, and so on. Graphs provide powerful means to represent complex datasets. As such, using graph analytics for anomaly mining has been a fast growing area of research in the past several years.

In this talk I will introduce several graph based techniques for mining anomalies in large graphs. First, I will focus on dynamic graphs and discuss recent work on selective ensemble methods for finding change points in time-evolving graphs. This work addresses challenges regarding how to integrate multiple heterogeneous detectors and how to assess their performance in order to effectively harness their outcomes. Next, I will present two new approaches for finding high quality neighborhoods in large attributed graphs, based on which outlier nodes and anomalous neighborhoods can be identified. Finally, I will shift focus to graph based solutions for two real world applications: opinion spam and link spam detection on the Web. We design our methods so as to not only detect the anomalies, but also to be able to describe them, which help the end users in explaining-away and sense-making of the detected anomalies.

Speaker Bio:

Leman Akoglu is an Assistant Professor in the Department of Computer Science at Stony Brook University since August 2012. She received her Ph.D. from the Computer Science Department at Carnegie Mellon University. She also worked at IBM T. J. Watson Research Labs and Microsoft Research at Redmond during summers. Her research interests span a wide range of data mining and machine learning topics with a focus on algorithmic problems arising in graph mining, pattern discovery, social and information networks, and especially anomaly, fraud, and event detection. Dr. Akoglu's research has won 3 publication awards; one Best Knowledge Discovery Paper award at ECML/PKDD 2009, a Best Paper award at PAKDD 2010, and a Best Paper at ADC 2014. She also holds 3 U.S. patents filed by IBM T. J. Watson Research Labs. Dr. Akoglu is a recipient of the NSF CAREER award (2015) and an Army Research Office Young Investigator award (2013). Her research is supported by the National Science Foundation, the US Army Research Office, Office of Naval Research, and a gift from Northrop Grumman Aerospace Systems. More details can be found at <http://www.cs.stonybrook.edu/~leman>.

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