

Twitter's Big Hitters

Desmond Higham, University of Strathclyde

Abstract

The digital revolution is generating novel large scale examples of connectivity patterns that change over time. This scenario may be formalized as a graph with a fixed set of nodes whose edges switch on and off. For example, we may have networks of interacting mobile phone users, emailers, Facebookers or Tweeters. To understand and quantify the key properties of such evolving networks, we can extend classical graph theoretical notions like degree, pathlength and centrality. In this talk I will focus on linear algebra-based algorithms and show that appropriate matrix products can capture various aspects of information flow around an evolving network. I will also look at continuous-time analogues and derive a dynamical system involving the matrix logarithm. I will show how these new dynamic centrality measures performed in a recent case study on Twitter data concerning travel insurance, where independent influence rankings were available from social media experts. I will also discuss the use of sentiment scores to analyse Twitter conversations around Premier League soccer events: the North London derby of November 2012 and the retirement of Sir Alex Ferguson/appointment of David Moyes at Manchester United.