Fourier Analysis of Network Metrics

Cadet Arthur Middlebrooks
Major Anthony Johnson
Department of Mathematical Sciences
U.S. Military Academy
West Point, NY 10996

Major Ian McCulloh
Network Science Center
U.S. Military Academy
West Point, NY 10996

ABSTRACT:

Statistical process control applied to longitudinal social network measures has been shown to effectively predict important changes in organizations. Due to the effects of relational dependence and periodicity in the data, the detection of change is often obscured by random noise. Fourier analysis is used to determine significant periodic frequency in longitudinal network data. Wavelets are used to filter out the noise, so that more accurate social network change detection can be performed.

KEYWORDS: network science, Fourier analysis, statistical process control, social network change detection.

CONTACT: Major Ian McCulloh, U.S. Military Academy, West Point, NY, 10996
Tel: (845) 702-9115, Email: ai6873@usma.edu