

STATISTICAL ANALYSIS AND DATA MINING

Research Article

Thought leaders during crises in massive social networksCourtney D. Corley , Robert M. Farber, William N. Reynolds

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Abstract

Making vast amounts of online social media data comprehensible to an analyst is a key question in operational analytics. Twitter and micro - blog conversations can easily be gathered from Internet services such as Spinn3r to create graphs representing the interactions between the entities in an online community that contains billions of vertices and tens of billions of edges. Graphs of this size can easily be represented in a modern laptop or workstation. The challenge lies in making them comprehensible. This paper focuses on methods to assemble social network graphs from online social media to reveal nodes that are 'interesting' in the context of operational analysis—meaning that the computational results can be interpreted by a human analyst wishing to answer some operational questions. Only metrics based on the structure of the graph are utilized, which avoid the challenges and costs involved in message content analysis. We further restrict ourselves to the use of metrics that are computational tractable on billion node graphs. The reported results demonstrate that nodes with a high impact or disproportionally large agency on the whole network (e.g., online community) can be found in a variety of online communities. Validation of the importance of these high - agency nodes by human and computational methods is discussed, and the efficacy of our approach by both quantitative methods and tests against the null hypothesis is reported. © 2012 Wiley Periodicals, Inc. Statistical Analysis and Data Mining 5: 205–217, 2012

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