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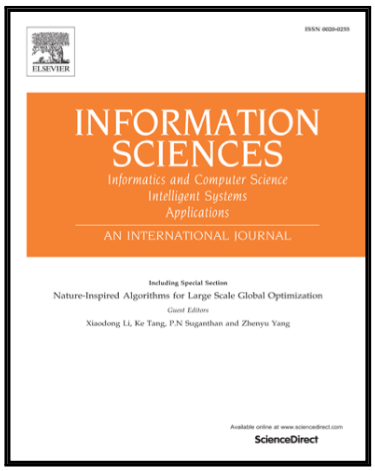

Forecasting Participants of Information Diffusion on Social Networks with Its Applications

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PII: S0020-0255(16)30845-3
DOI: 10.1016/j.ins.2017.09.034
Reference: INS 13138

To appear in: *Information Sciences*

Received date: 11 September 2016
Revised date: 30 May 2017
Accepted date: 11 September 2017

Please cite this article as: Cheng-Te Li, Yu-Jen Lin, Mi-Yen Yeh, Forecasting Participants of Information Diffusion on Social Networks with Its Applications, *Information Sciences* (2017), doi: 10.1016/j.ins.2017.09.034

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Forecasting Participants of Information Diffusion on Social Networks with Its Applications

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Abstract

Social networking services allow users to adopt and spread information via diffusion actions, e.g., share, retweet, and reply. Real applications such as viral marketing and trending topic detection rely on information diffusion. Given past items with diffusion records on a social network, this paper aims at forecasting who will participate in the diffusion of a new item c (we use hashtags in the paper) with its k earliest adopters, without using content and profile information, i.e., finding which users will adopt c in the future. We define the Diffusion Participation Forecasting (DPF) problem, which is challenging since all users except for early adopters can be the candidates, comparing to existing studies that predict which one-layer followers will adopt a new hashtag given past diffusion observations with content and profile info. To solve the DFP problem, we propose an Adoption-based Participation Ranking (APR) model, which aims to rank the actual participants in reality at higher positions. The first is to estimate the adoption probability of a new hashtag for each user while the second is a random walk-based model that incorporates nodes with higher adoption probability values and early adopters to generate the forecasted participants. Experiments conducted on Twit-

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