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Preface - Special Issue on Misinformation on the Web

Misinformation threatens democracy, economics, and society at a global scale. For the past few years, there has been a rapid rise in the use of different forms of misinformation such as rumours, spam reviews, conspiracy theories, social bots, and manipulative campaigns. While the emergence of misinformation has quickly evolved into a worldwide phenomenon, a vast effort is under way that attempts to understand this phenomenon. However, most of these efforts have focused only on reducing the problem to a detection task. Unfortunately, detection techniques do not necessarily help to understand the characteristics of misinformation in depth. There is a need to investigate misinformation from a variety of different perspectives.

This special section presents new and original works that advance the concepts, methods, and theories of misinformation as well as proposes mechanisms for mitigating misinformation.

In the article entitled "Caught in a Networked Collusion? Homogeneity in Conspiracy-Related Discussion Networks on YouTube", Daniel et al., studied the dissemination of conspiracy theories to reach a massive audience via YouTube due to YouTube's world-reaching network effects. Specifically, the article develops a machine learning model based on BERT to identify conspiracy and counter-conspiracy videos as well as their associated user comments and the interconnections between them.

Yuxin et al., in their paper titled "Detection of Spam Reviews through a Hierarchical Attention Architecture with N-Gram CNN and Bi-LSTM", studied the effects of spam reviews on consumer decision making and fair trading in online markets. Specifically, the article develops a hierarchical attention network in which distinct attentions are purposely used at the two layers to capture multi-granularity semantic information in spam reviews.

In their work entitled "Detecting inorganic financial campaigns on Twitter", Serena et al., studied the virality of online financial content on social media, especially on Twitter. The results show that the more viral a stock is on Twitter, the more that virality is artificially caused by social bots. Starting from this finding, the authors proposed classification and regression models to identify financial misinformation, with hundreds of features to encode the characteristics of viral discussions.

In a similar context of dealing with social bots in social media, the article entitled "Bot2Vec: A general approach of intra-community oriented representation learning for bot detection in different types of social networks" by Phu et al., presented a new network representation learning approach to capture machine accounts and social bots. The model is designed to automatically preserve both local neighbourhood relations and the intra-community structure of user nodes while learning the representation of a given online social network, without using any extra features based on the user's profile.

Finally, in "Deep Reinforcement Learning based Ensemble Model for Rumor Tracking", Guohui et al., built an end-to-end framework for tracking rumours. The authors developed a deep reinforcement learning-based ensemble model for rumour tracking, which aggregates multiple components by weight-tuning and utilizes specific social features to improve the performance.

In conclusion, we present five articles that tackle misinformation on the Web from different angles, including networked data, user reviews, online discussions, social data, and news data. Within the next few years, misinformation is likely to become an oppressive force in our daily lives. We recommend that future research should reflect those emerging challenges.

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