Rumor Blocking through Online Link Deletion on Social Networks

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In recent years, social networks have become important platforms for people to disseminate information. However, we need to take effective measures such as blocking a set of links to control the negative rumors spreading over the network. In this article, we propose a *Rumor Spread Minimization* (RSM) problem, i.e., we remove an edge set from network such that the rumor spread is minimized. We first prove the objective function of RSM problem is not submodular. Then, we propose both submodular lower-bound and upper-bound of the objective function. Next, we develop a heuristic algorithm to approximate the objective function. Furthermore, we reformulate our objective function as the DS function (the Difference of Submodular functions). Finally, we conduct experiments on real-world datasets to evaluate our proposed method. The experiment results show that the upper and lower bounds are very close, which indicates the good quality of them. And, the proposed method outperforms the comparison methods.

CCS Concepts: • **Networks → Network algorithms**; • **Theory of computation → Design and analysis of algorithm**;

Additional Key Words and Phrases: Social network, rumor blocking, approximation algorithm, non-submodularity

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1 INTRODUCTION

In the past decade, social networks such as Twitter and Facebook have become an important part of people's daily lives. According to the statistics, there have been 2.13 billion monthly active users

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