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DOCTORAL THESIS ABSTRACT

Heterogeneous influence on the information diffusion processes in social networks

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The representation of social networks in electronic systems has evolved from early technical systems to advanced social media integrating communication and interaction mechanisms similar to those known from the real world. The development of social media platforms has influenced the need to understand the behaviors, patterns and predispositions of millions of online users and how they relate to behaviors in the real world.

The processes of diffusing information, apart from social relations and online activity, are phenomena that attract the attention of both researchers and practitioners. In many cases, electronic communication, based on the processes of diffusing information in social networks, gives better results than traditional advertising campaigns. Research related to the diffusion of digital content is focused on factors influencing the success of a campaign, factors influencing the participation of users in the process of disseminating information, or the choice of users on the Internet to initiate a campaign. Moreover, the influence of the role of various centrality measures in the selection of initial influencers, the roles of content and structures in networks, user motivation to communicate content, as well as the role of emotions and other factors in the information diffusion process are investigated.

Much previous research has focused on theoretical and empirical approaches to maximizing coverage, i.e. increasing the number of nodes reached in the network. While coverage is an important measure of campaign success, from a practical point of view, information diffusion campaigns on social networks can have different goals and specificities. Different strategy can be used to acquire a large number of potential customers in a very short time than in the case of the need to achieve organic growth of the customer base with given characteristics. In order to take into account different goals, one can use multi-criteria evaluation of the process and select parameters and goals according to the decision-maker's preferences and priorities.

The main goal of the doctoral dissertation was to develop and verify algorithms for heterogeneous influence on the processes of information propagation in complex networks with the participation of complex rankings, taking into account multi-criteria assessment of effectiveness, in order to increase the coverage of the process, its dynamics or other characteristics according to the preferences of the decision-maker.

The dissertation was compiled as a series of 10 thematically related articles – four articles published in international open-access journals, five articles published in peer-reviewed conference materials and one chapter of a monograph. The sum of ministerial points for the cycle is 875 (weighted sum 518). The total Impact Factor of the cycle is 10.762.

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