

# An introduction to the multilayer network for characterisation of information spreading related to the COVID-19 crisis\*

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**Abstract.** Communication in social media has been gaining importance in responses to major crises, such as COVID-19. In emergency situations, there is an urgent need to rely on trustworthy information. On the other side, we are all witnessing a huge amount of misinformation, fake news and conspiracy theories spreading in social media, especially during a crisis. The automatic recognition of information spreading patterns may improve various aspects of crisis communication, such as for example detection, prediction and preventing fake news spreading. The first step toward understanding the information spreading patterns is to perform a quantitative and qualitative analysis of textual information posted and shared in social networks. In previous research, it has already been shown that there are differences in spreading of fake news and true news. However, the COVID-19 crisis brings a whole new realm of challenges in terms of large communication volumes that results with massive datasets, new terminology, new aspects and new specific topics that have come into the focus.

In this research we propose a novel framework based on multilayer networks that enables information spreading characterisation. Our approach integrates social network analysis methods and natural language processing algorithms. Thus, the proposed framework capture three sets of information spreading features: (i) content, (ii) context and (iii) dynamic. One of the goals of this research is to define a classifier that can identify fake and truth news based on these features.

**Keywords:** multilayer network · social network analysis · information spreading · fake news detection · COVID-19.

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