



MITIGATION STRATEGIES AGAINST MISINFORMATION DIFFUSION IN SOCIAL NETWORKS



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References

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- [2] N. Arhachoui, E. Bautista, M. Danisch, A. Giovanidis, A Fast Algorithm for Ranking Users by their Influence in Online Social Platforms, in: *The 2022 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM 2022)*.

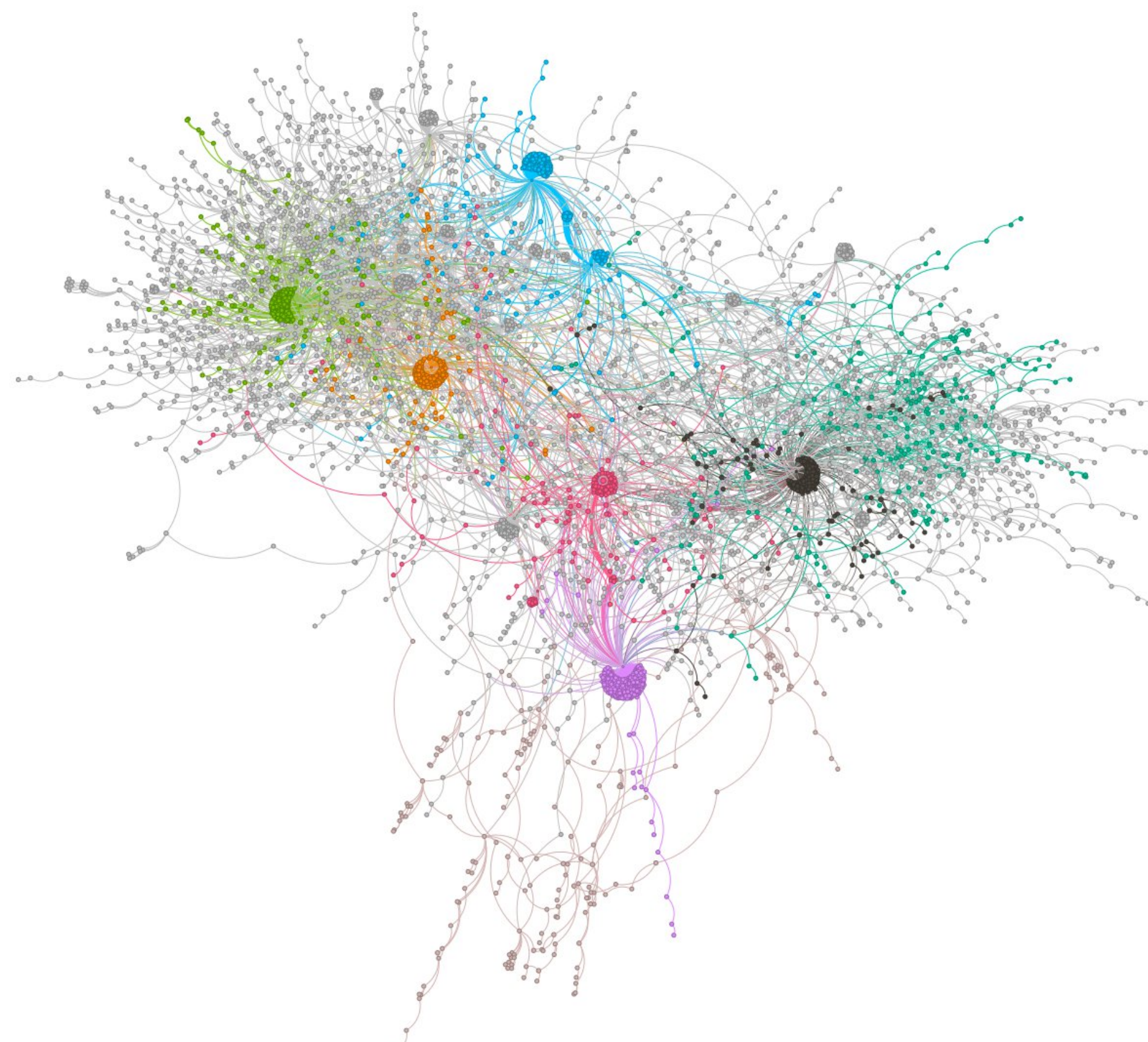
Affiliations



CONTEXT

Misinformation has been recognized as a major challenge for modern society, as it can lead to widespread confusion, social polarization, and even harm public health and safety. Therefore, the development of effective techniques for detecting and **characterizing misinformation propagation** in social networks is crucial for ensuring the accuracy and reliability of information on these platforms.

Thus, our work aims to develop **graph-based algorithms** to characterize and detect the diffusion of fake news in these networks. By analyzing the **patterns of propagation**, the goal is to classify and identify **information cascades**.



BACKGROUND

THE SPREAD OF FAKE NEWS

Related research [1] showed that fake news spreads significantly **faster** and **farther** than true news in all categories of information, with **fake political news** being the most affected. This phenomenon is due to the novelty factor of fake news, which attracts more sharing, as well as their emotional impact. Contrary to popular belief, robots do not contribute more to the spread of fake news than to true news; humans are responsible for spreading fake news more widely.

PROBLEM STATEMENT

DETECTING AND MITIGATING THE FAKE NEWS DIFFUSION

Given a set of news information, we want to be able to capture the **topological structure** of their diffusion path — such as the **depth, density, virality** — in order to classify them as real or fake news. Then, we plan to go further by proposing novel mitigation strategies by means of machine learning algorithms.

CHALLENGE

The proliferation and the **massive number** of social networks' users makes it necessary to **automate** the process but the major challenge is to go beyond fake news detection and tackle the problem of **propaganda**.

METHOD

GRAPH NEURAL NETWORKS

To achieve our goal, we make use of **Graph Neural Networks (GNNs)**, a type of neural network designed to operate on graph-structured data. By **modeling the interactions** between nodes and edges in the social network, GNNs can take as input a cascade (or diffusion path) and learn to capture the complex relationships between users and identify **patterns of information diffusion**. Specifically, we use GNNs to learn **embeddings** for each news' diffusion path in the social network, which can be used as input to a classifier to detect fake news diffusion. We also want to leverage user influence [2] to detect **anomalous behavior**.

