ALGORAND NETWORK ANALYSIS

AUTHORS

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NETWORK ECONOMY

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INTRODUCTION

This project is based on the network analysis on a Discord channel about Algorand blockchain, created in 2019. in the time frame from November 2020 to April 2023. The messages, discussion topics and activities of the post authors were analyzed to study the network and the possible correlation with the crypto-currency market trend.

METHODOLOGY

For the analysis we used a json file extracted from the channel, then transformed into 3 csv files *"Messages"*, *"Authors"* and *"Mentions"*. The datasets contain all information related to conversations between 1132 users and 13944 posts. As analysis tools we used:

python™   matplotlib   NetworkX
Network Analysis in Python

We extracted the topics of conversation with a Topic Modeling; in the definition of clusters and communities we used the algorithms of Girvan-Newman and Greedy Modularity.
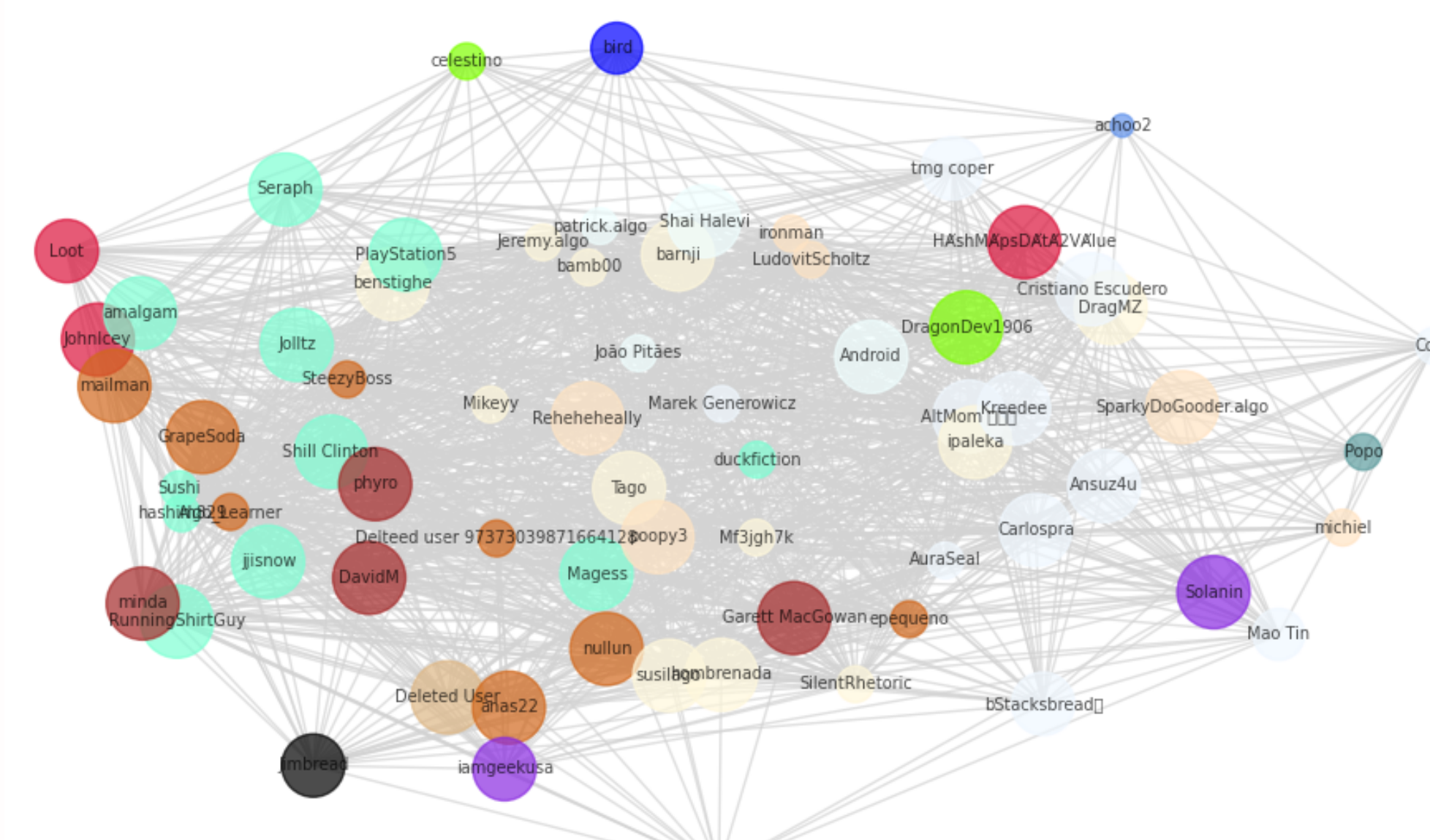
CONCLUSION

Different communities tend to form within the channel, although social habits and discussion topics remain unchanged during the period under consideration. Furthermore, associations have emerged between chat activity and market performance but we cannot state how the two forces influence each other.
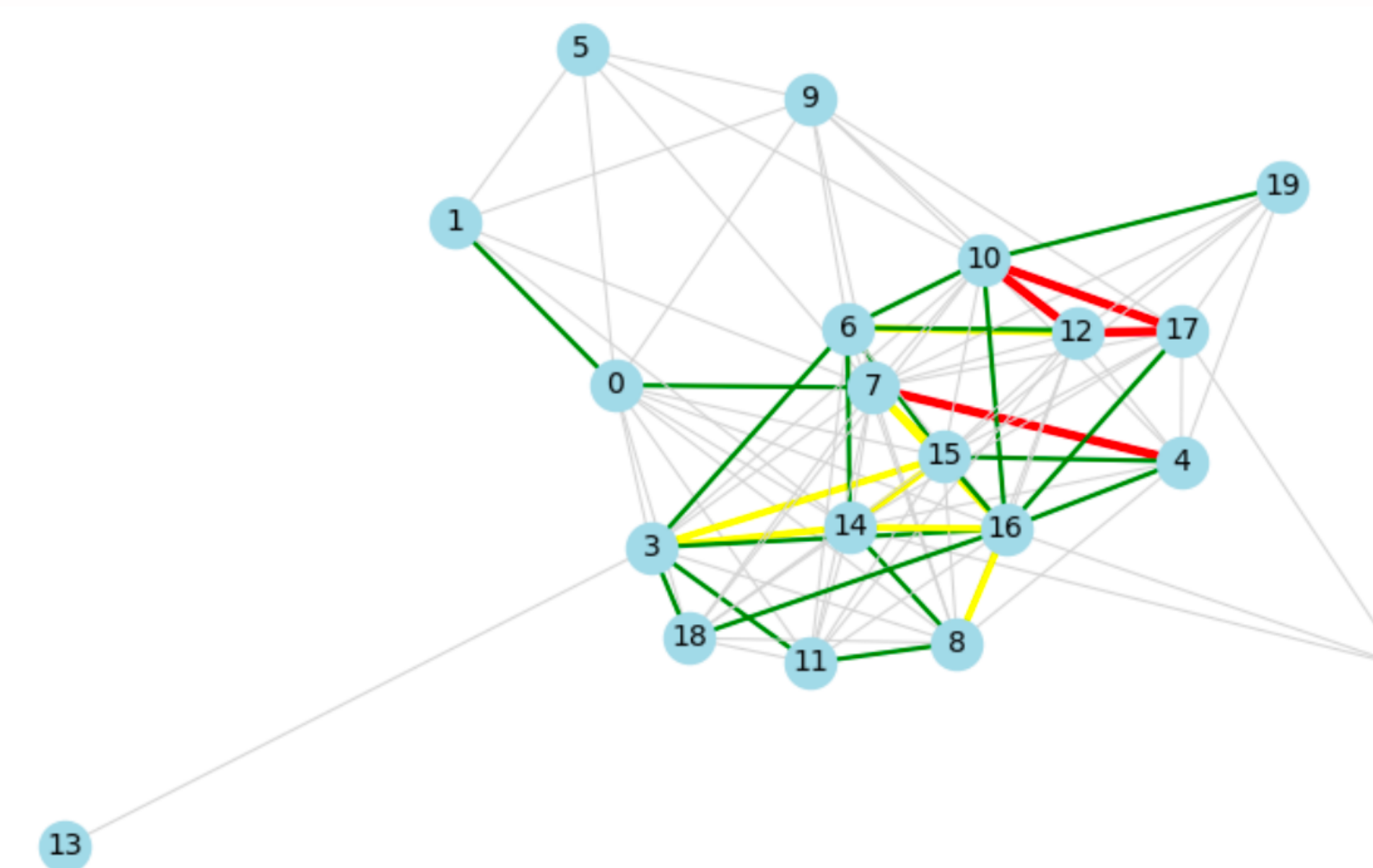
ANALYSIS
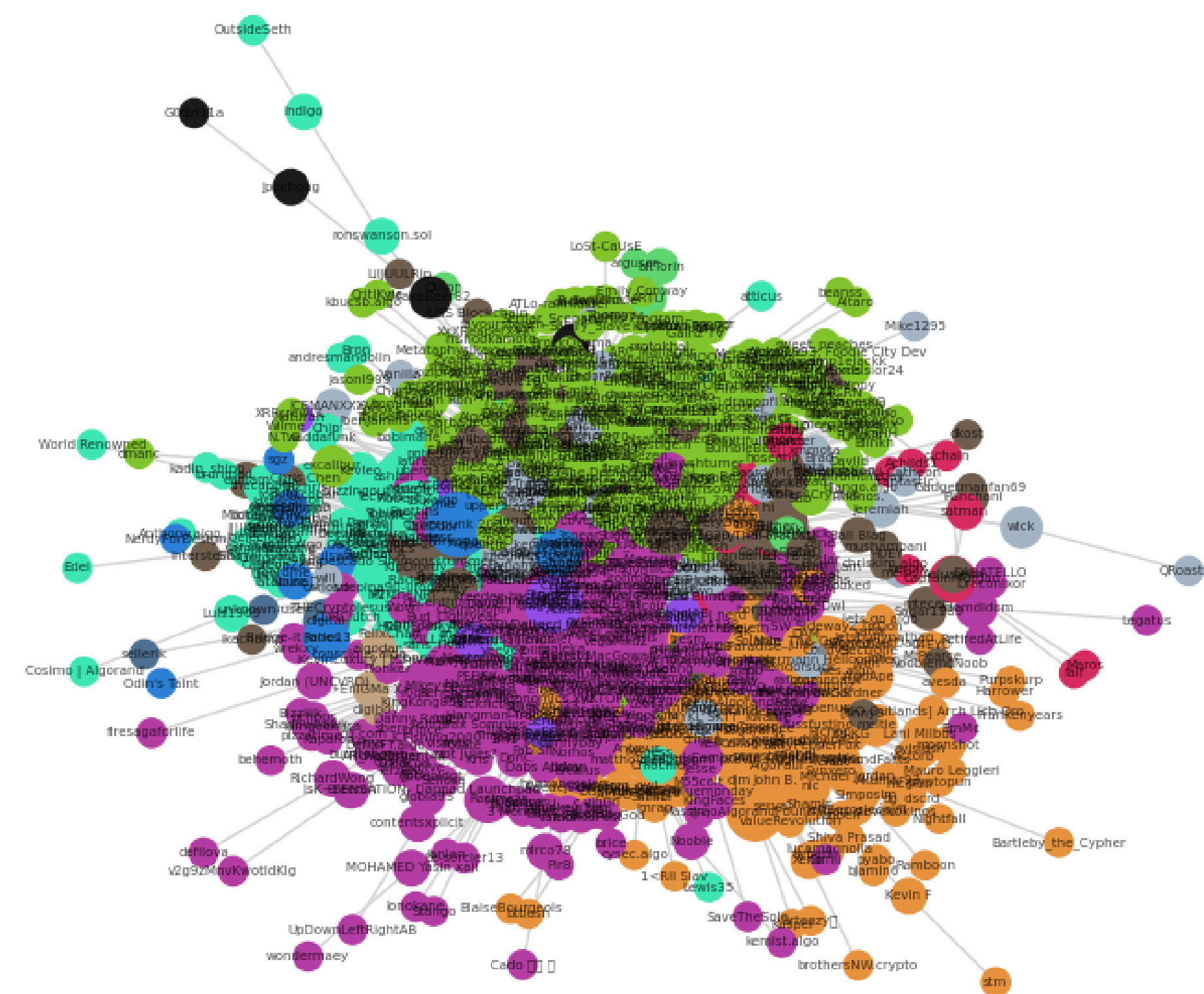
*Fig. Cluster analysis based on authors's mentions

First question: find any communities or clusters within the chat in order to analyze the social behavior of users. This graph focuses on the central and non-peripheral communities within the channel obtained with the Greedy-Modularity algorithm, as nodes and authors related to each other according to the mentions received. The most important communities are 4.

*Fig. Authors network based on topics of discussione - 2°semester

Second question: find community among the authors in relation to the topics discussed. This graph illustrates the community extracted from the second semester of activity on the channel. The average grade assumes a high value because, in general, the authors share the same main arguments.

*Fig. Topics network based on the keywords in common

Third question: analyze the similarity between topics in relation to the keywords in common. This graph illustrates the relationships between the nodes (topics) over the entire period of time and we note that the topics are closely connected to each other, a sign of the fact that the topics resulting from the topic analysis do not differ significantly.
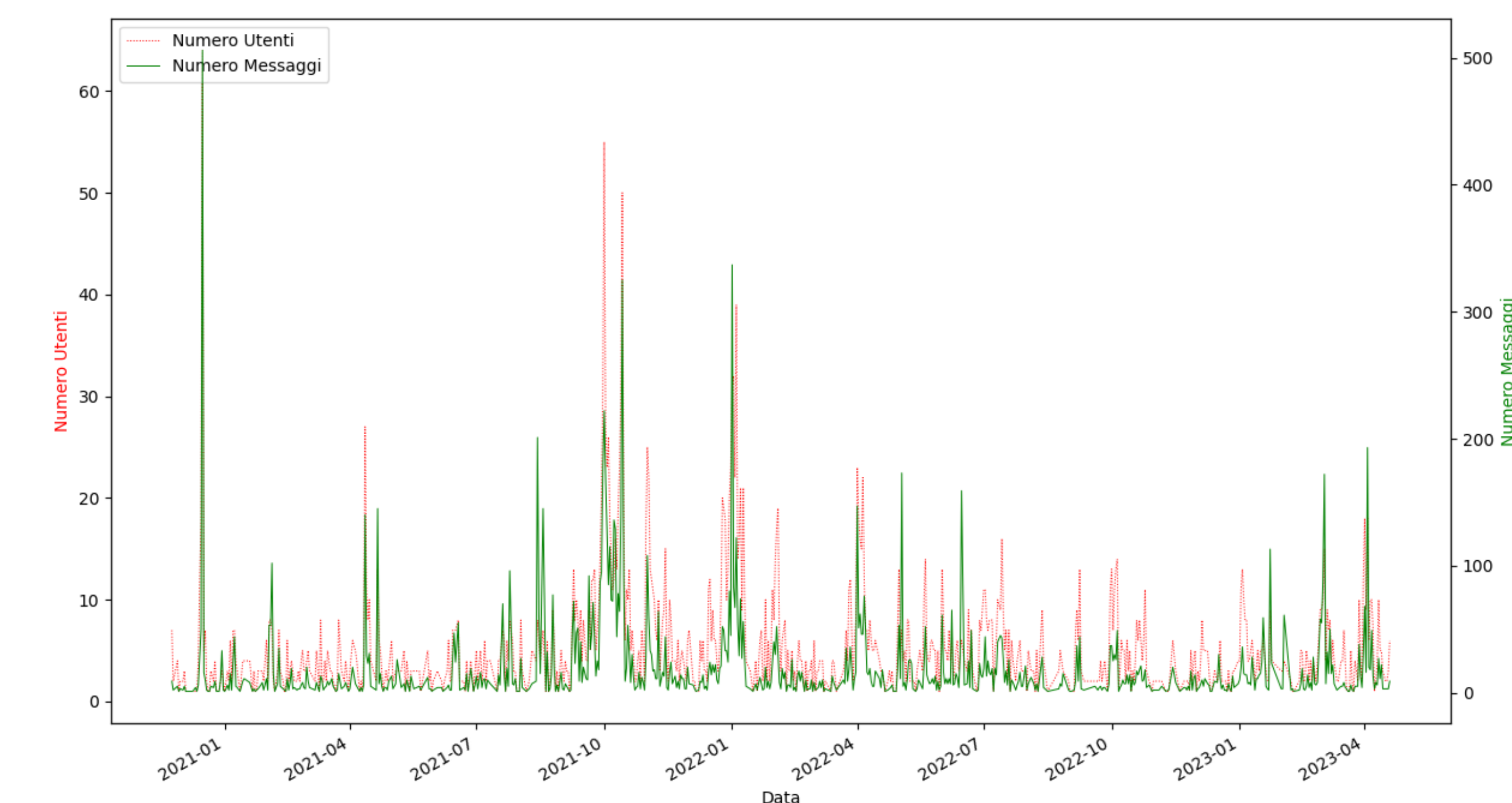
*Fig. Number of messages and active authors per day

RESULTS

Our analysis was guided by the desire to verify through the data whether there was one or more communities that influence the discussion topics in the channel and the related associations to Algorand's performance on the stock market. We also wondered if the frequency of the messages posted was connected to growth or loss in the price and market cap of the cryptocurrency. We've noticed that there are effective communities of authors who tend to mention each other, that topics don't change significantly over time, and that more lively conversations are associated with positive periods in the market.

REFERENCES

CoinMarketCap   NetworkX
Network Analysis in Python   DISCORD

Algorand

CODE LINK   colab