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Application of Liquid Rank to Identify Opinion Leaders

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What is Liquid Ranking System?

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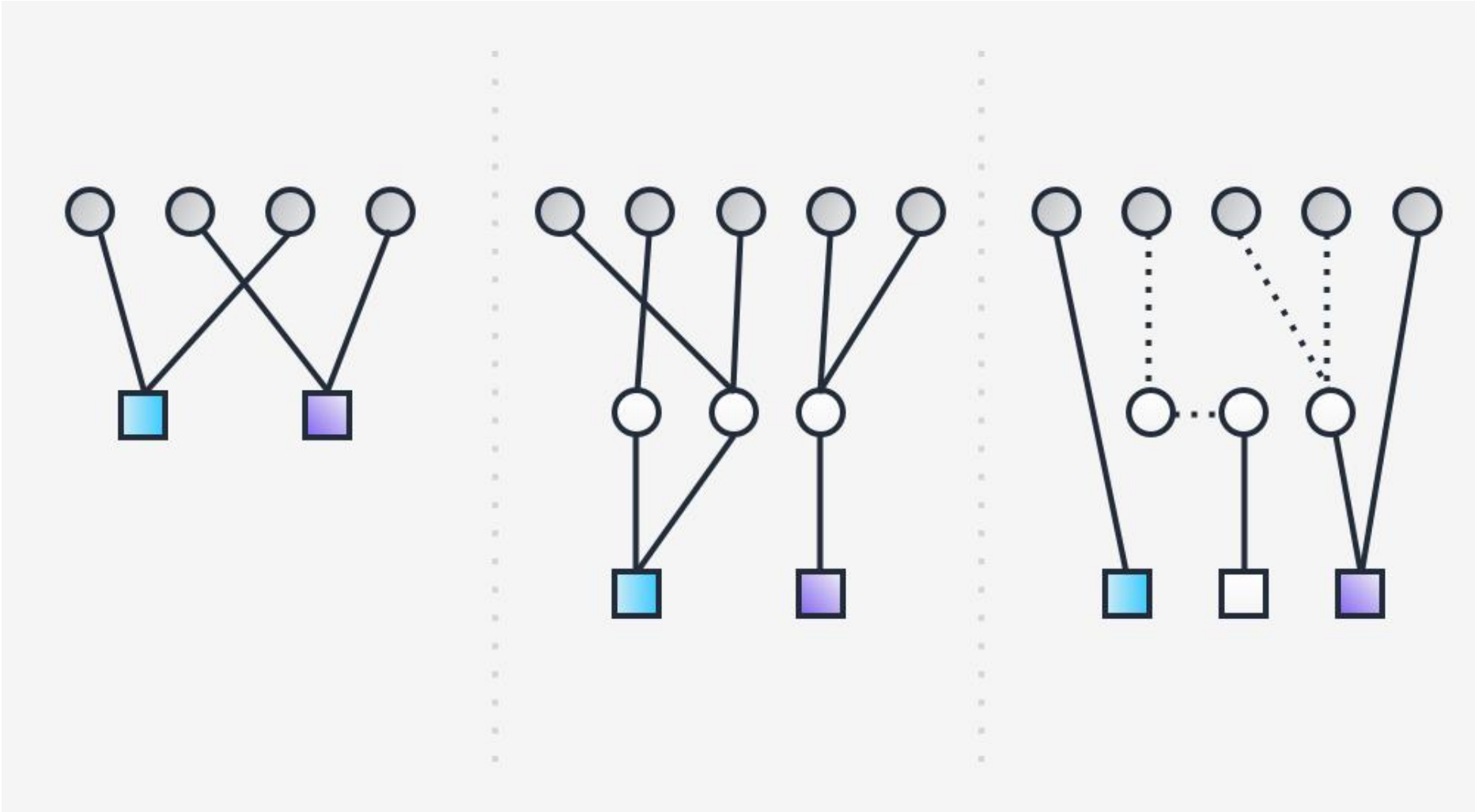

Direct Democracy Representative Democracy Liquid Democracy

WHAT IS LIQUID RANKING SYSTEM?

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Liquid Democracy is implemented through Liquid Ranking.

- Liquid Ranking is nothing but earned rank in a Liquid Democracy (eg. Decentralised Platforms)
- Most of representative democracies have failed because they were overshadowed by financial powers.
- So, the answers come through the reputation power of individuals for the ranking.
- Each rank is calculated by the individuals on a platform, through features eg. followers, likes, comments, subscribers, etc.

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A simple computational model of reputation is calculated as

$$Rj = \sum (Ri * Vijt)$$

- **Ri: Initial reputation of ith node (initially considered as 1 for all)**
- **Vijt: It can be implicit rating as positive or negative vote or implicit rating as wire transfer amount, either spent or received, for node j being rated, node i supplying the rating and time t. (Weights)**
- **Reputation is calculated for nodes, but it is assumed that each node plays a multi-agent social network role, such as a user, user account, software agent or decentralised system. Nodes during their operation, so that their artifacts can be indirectly rated by posts and comments on social networks or by messages or tasks in multi-agent systems.**

Liquid Ranking for Identifying Opinion Leaders in Given Twitter Dataset (Cryptonews Feed)

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- **DATASET: Sample dataset from Twitter and Reddit on Crypto related chats and talks has been taken for finding opinion leaders (or can be considered as recommendation for new channels on twitter which are having impact on the related topic in that time frame)**

- **Only Twitter Data is selected upon to build the algorithm of Content Recommendation System.**

- **Opinion Leaders are found on the basis of the “Mentions” by the selected channels which were used to fetch data in that time frame.**

- **Considering direct mentions by the channels as the area of interest to find new recommendation ranking.**

Liquid Ranking for Identifying Opinion Leaders in Given Twitter Dataset (Cryptonews Feed)

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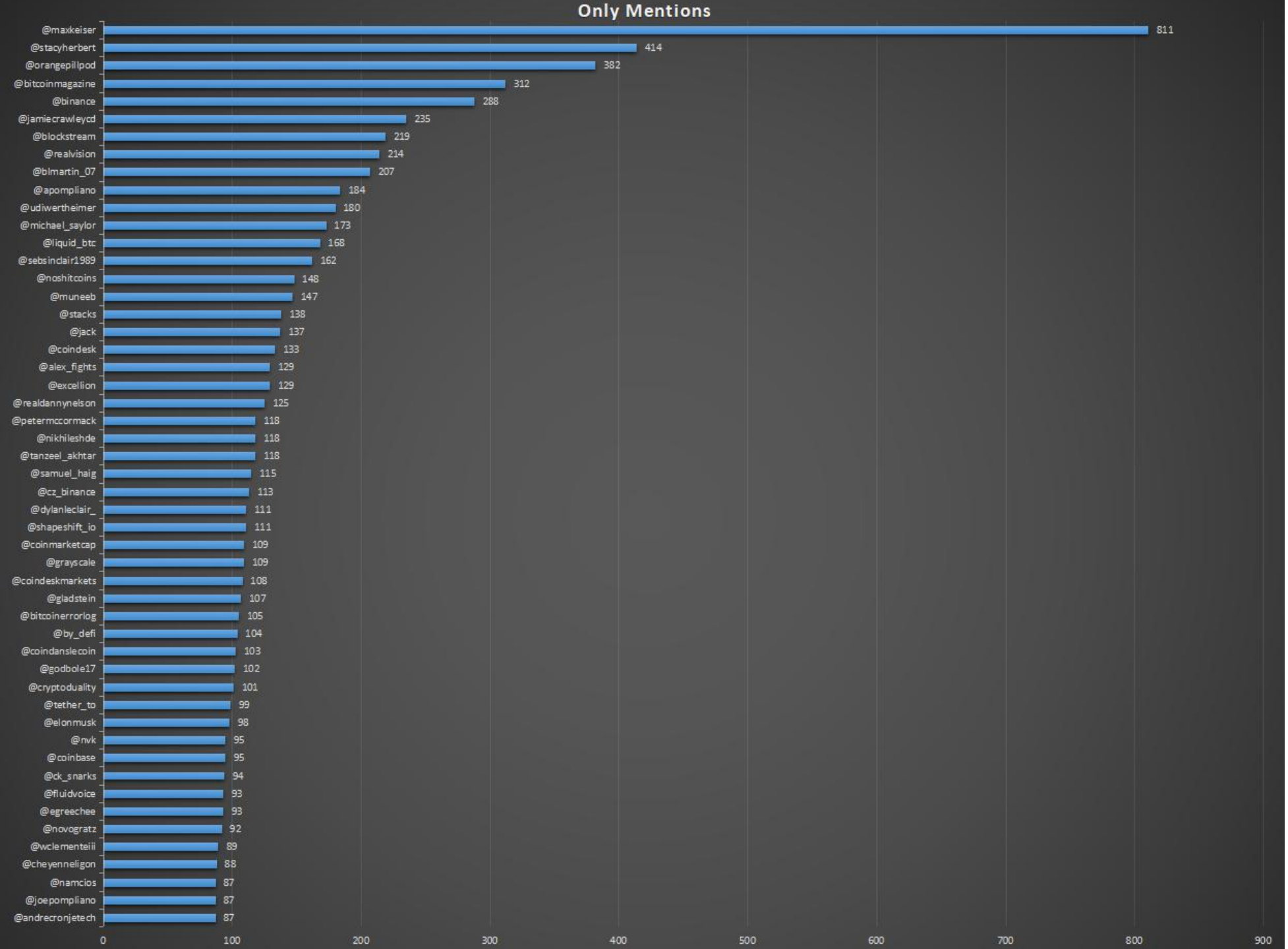
Identifying opinion leaders by liquid ranking:

Algorithm used to build the Architecture for Content Recommendation:

$$\mathbf{Rj} = \sum (\boldsymbol{Ri} * \boldsymbol{Vijt})$$

Architecture: Code has been built from scratch currently, will need updation according to new features in future.

- **Initially reputation score was given as 1 to everyone.**
- **Opinion Leaders are found on the basis of the "Mentions" by the selected channels, these mentions work as Weights (multiplier) to build new reputation score.**
- **Every loop of reputation scoring, follows normalisation of data (within positive range)**
- **The end results are as follows.**



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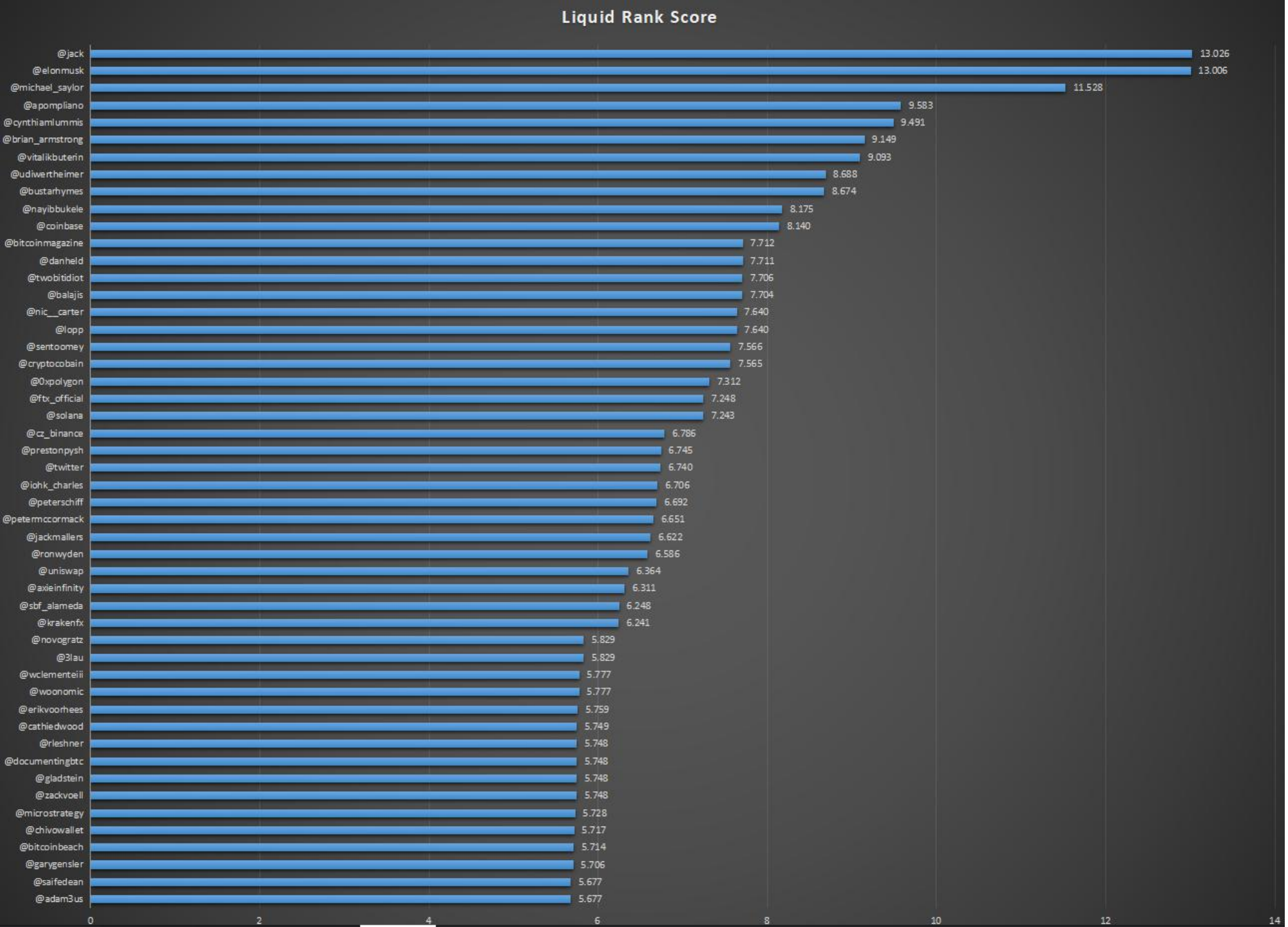
END RESULTS



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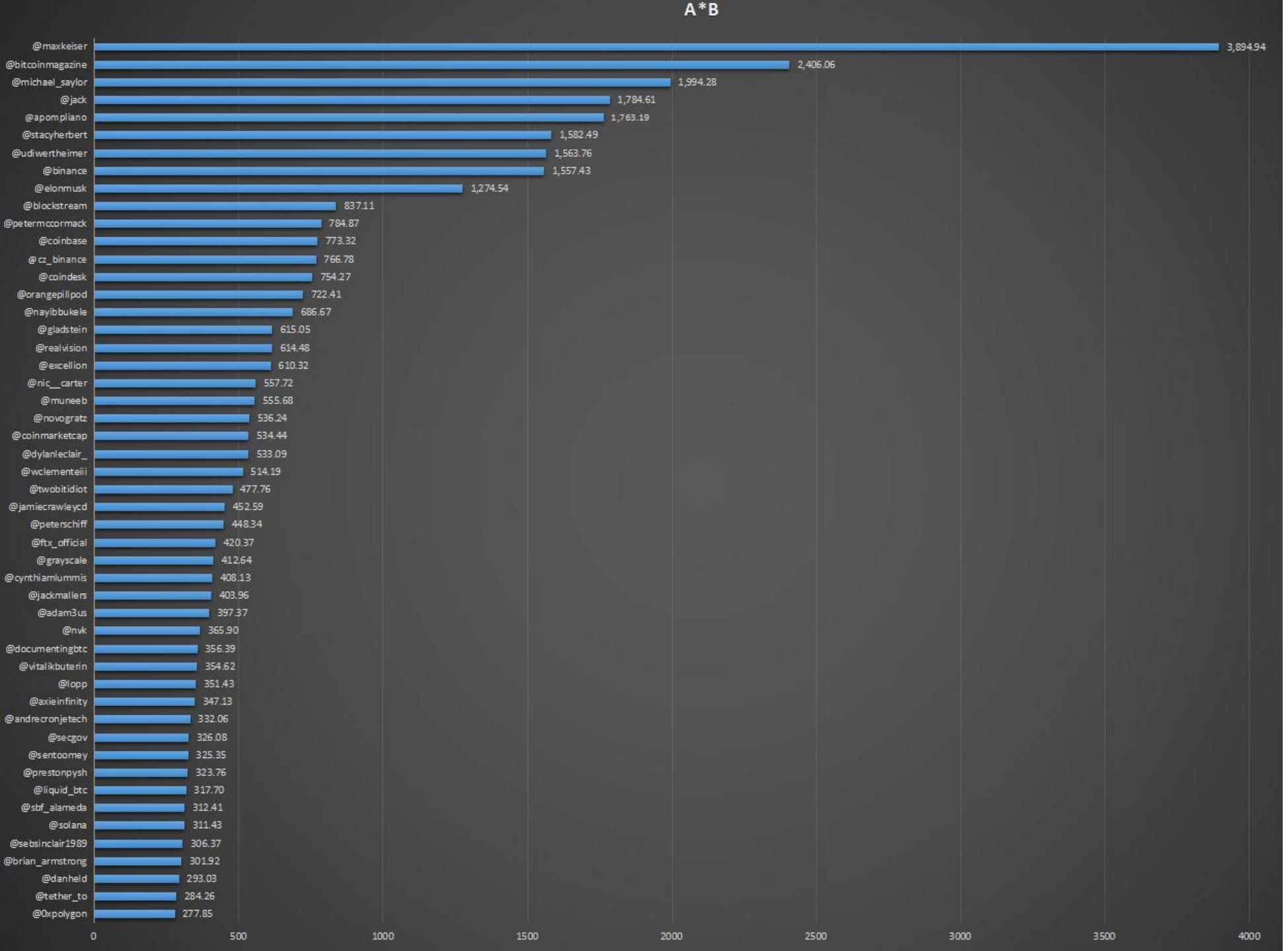
END RESULTS



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END RESULTS

LIQUID RANKING FOR IDENTIFYING OPINION LEADERS IN GIVEN TWITTER DATASET (CRYPTONEWS FEED)

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- **BY MENTIONS (A):** It shows that the top ranking mentions in the list are the Twitter channels which are ofcourse very influencial and large followings.

- **BY LIQUID RANKING (B):** It shows that the top leaders in the Liquid Ranking are not only the channels which were mentioned alot but also are the ones mentioned across different channels.One more thing that can be fetched in current stage that top leaders in Liquid Ranking are not essentially very popular channels, but were somehow popular in that time frame of data fetching.

- **RESULTS BY A*B:** We see that the top leaders on the list are the ones who got the most number of mentions overall in the data, it makes sense as it a product of weights in both categories.

Liquid Ranking for Identifying Opinion Leaders in Given Twitter Dataset (Cryptonews Feed)

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- The primary results of the course work shows us that Liquid ranking system is giving us the most relevant Opinion leaders. In the sense that channels are being mentioned by the selected channels.

- Secondly, the Liquid rank system also consider the weights by the mentions overall, but as a second layer.

- When observed, we could see that the because of Liquid ranking, the channels with less followers also have came up in the ranking. It points towards the relevant notion of Liquid democracry, which is not based just on the weightage but by the distributed weightage in the given dataset.

End Results

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- **LIQUID RANKING CODE: https://github.com/xenvik/Recommendation-Model/blob/main/Liquid_Ranking.py**

- **RANK COMPARISON (BY MENTIONS AND LIQUID RANKING):**

Final_Results.xlsx

FUTURE SCOPE ON WORK

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LIQUID RANKING CODE:

$$\mathbf{Rj} = \sum(\boldsymbol{Ri} * \boldsymbol{Mijt}) + \sum(\boldsymbol{Ri} * \boldsymbol{Fijt}) + \sum(\boldsymbol{Ri} * (\boldsymbol{Oijt} + \boldsymbol{Cijt} + \boldsymbol{Dijt} + \boldsymbol{Sijt})$$

Here

M: Mentions

O: Likes (very difficult to track)

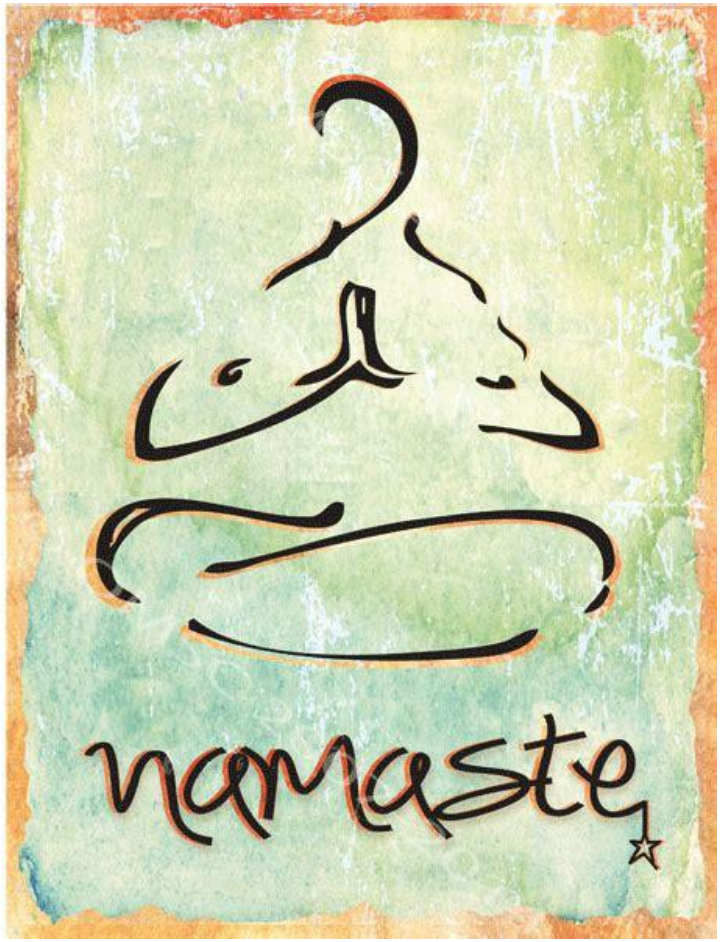
C: Comments (sentiments)

F: Followers

D: Retweets (time restrained)

S: Personal Recommendation

- **RANK COMPARISON (BY MENTIONS AND LIQUID RANKING): We will work to implement liquid ranking by the followers of the mentioned Twitter channels to add one more layer to Content Recommendation. Overall other features as mentioned above can be implemented and form a matrix for liquid ranking, individually and collectively to get the most efficient personlised recommendation for the user experience.**



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