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Twitter Data Extraction Method for Community Detection on Social Media

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Abstract- *In the present situation web-based media is an arising field for some analysts. In web-based media the information created through client side is colossal. To keep up with the client produced information there are many mining errands are available in online media mining. There are numerous long range interpersonal communication destinations where client makes their own local area based on their advantage. As it is realized that web-based media is a major virtual world in that numerous clients have their profile and they are associated with various sort of gatherings. Community discovery is the main element of online media. It is like the grouping element of information mining. In part based local area recognition a ton of work has been done, yet distinguishing local area through impact is an alternate method of identification in online media mining. The primary goal of the exposition is to recognize the local area taking advantage of Leverage. Major issues of community detection are scalability and quality of the community. Some of the algorithm scalable in large network and provides better results as compare to other algorithm. We have compared the algorithms on the social data of the twitter. As result it is prove that algorithms are scalable in the large network as per the evaluation parameter. The unique feature of this thesis is that we have evaluated all the features of the algorithm on the large social network.*

Keywords:- Twitter Dataset, Data Extraction, Social Media, Community Detection, Social Networks.

Introduction

In the present situation web-based media is an arising field for some analysts. In web-based media the information created through client side is colossal. To keep up with the client produced information there are many mining errands are available in online media mining. There are numerous long range interpersonal communication destinations where client makes their own local area based on their advantage. As it is realized that web-based media is a major virtual world in that numerous clients have their profile and they are associated with various sort of gatherings. To know the conduct of the client it is important to comprehend the foundation of client. It isn't so much that that simple in informal organization to recognize the conduct of the single client, subsequently it is expected to perform local area discovery in interpersonal organization. Numerous specialists had accomplished parcel of work in this field of the informal organization.

There are most famous destinations in the web world for online media where clients can make diverse social connections and gatherings of various individuals of various reasoning and perspectives. This sort of locales is known as informal communication destinations. Here clients can share substance and assets. Instances of these destinations are (https://www.facebook.com), (https://www.twitter.com), (https://www.friendsnet.com, etc.

Jack and Scott authored something about web-based media in 2011 to portray online informal organization. Online media is the assortment of electronic transmission advancements, where client gets a capacity to rise out of purchasers of content to distributers. In 2011 oxford college characterizes that online media is an electronic application for interpersonal interaction [1].

Interpersonal interaction is characterized as the utilization of committed social destinations for correspondence with different clients, or to discover individuals with comparable interests. After additional

examination Kalpan and Haenlien in 2010 said by association for monetary participation and improvement content given by the client should meet three fundamental necessities to qualify as UGC (client produced content).

1. Content should be distributed to all web clients or to a chose bunch (barring sends and texts).
2. It ought to be imaginative and unique not the reproduction of one more's substance of the other client.
3. It ought to be made separated from proficient schedules and not utilized for business reason.

Kalpan [1] and Haenlien [1] give a contention that the orderly characterization of online media can be troublesome, in light of the fact that new locales foster each day. This contention brings web-based media as an arising field for analyst in research region [1].

II. Related Work

In this paper creator's goal is to acquire proper components from online media information that address complex relationship which is utilized to recognize powerful networks. Their commitment is in a few perspectives: first and foremost they broaden existing methodologies for character dependent on client's conduct extricated from online media information; then, at that point, they distinguish the mining calculations that best arranged for every character characteristic. They proposed the compelling networks extraction philosophy (T-PICE), a bound together structure that extricates clients character dependent on a few parts of clients conduct [5].

In this paper creator introduced a successful and effective structure dependent on nearby impact to identify both covering and various leveled networks. There proposed structure is appropriate to handle the issue of heuristic impact amplification. Their calculation initially evaluated the neighborhood impact and afterward discovers the local area [6].

In this paper creator proposed a structure which is straightforwardly distinguishing networks in an organization absent setting. They have utilized social diagram and log movement information for discovering persuasive hub and local area. They suggested that system to manage the aspiring issue of inducing the local area structures [7].

In this paper creators approach is to discover networks in both organization (coordinated and undirected) successfully. Here creator utilizes the term shared-impact Neighbor similitude. It implies two hubs have same arrangement of neighbor hubs [8].

In interpersonal organizations, the impact of the various individuals locally isn't something similar. Each people group has some center individuals their impact is far more prominent than the others. In this view, a local area disclosure calculation is proposed to discover center individuals from the local area. Select introductory individuals from these center individuals that will have the best impact [10].

In this paper creator see that a correspondence of a powerful client is probably going to arrive at a lot a larger number of clients than the equivalent made by a client having lesser impact in the organization. In light of this perception, they have detailed a strategy utilizing the spread of correspondences. We have confirmed the technique on three datasets downloaded from 'Twitter' and results are observed to be awesome among existing strategies on the said datasets. In this paper they examined about deciding most affected hubs in an interpersonal interaction site. Spread of the correspondence has been acquainted here with decide the impact clients. They have thought about as it were "Twitter" in depicting the proposed technique. As the long range interpersonal communication are locales contrast in construction and objective [11].

In this paper creator have overview the distinctive local area identification calculation and applied a portion of the calculation on the genuine organization and manufactured organization. The fundamental focal point of this paper is to actually take a look at the exhibition of the calculation in genuine organization. Aftereffect of the review is that there are two significant issues; 1) nature of the identified networks and 2) adaptability of the calculation [12].

In this paper creator is attempt to utilize hereditary calculation for recognizing the networks. As contrast with other local area discovery calculation, hereditary calculation is more versatile in huge organization and it needn't bother with any earlier information about number of networks or any edge. Creator have tried the exactness of the calculation on notable datasets; Zachary karate club, school football. Select email dataset is utilized to actually look at the versatility of the calculation. Objective of the creator is to streamline the organization particularity utilizing hereditary qualities [13].

In this paper author use the approach of detecting community on the basis of node attributes. It is said that one node can be a part of two or more communities on the basis of their attributes. So, for performing clustering on the basis of node attribute two sources of data is require; first is the data/known properties of the object (nodes) and second, source of data come from the network, a set of connection between objects. Through this paper author developed CESNA method for identifying overlapping community detection in network [14].

Today's research and science has provided significant advances to understand the complex network. The most relevant feature of graph is to represent real system as community structure or clustering. Main focus of the author is to develop the technique through which complex network is divided into small communities through which it better to understand the flow the network [15].

The author presented a survey on the fundamental concepts and methodological principles of clustering algorithm. Small modules of graph are known as cluster or community. Firstly author is concerned regarding the principles of the clustering algorithm and secondly it is concerned regarding the properties of the good cluster. Author has represent methods and metrics for evaluating graph clustering results [16].

III. Methodology

Data Extraction: It is a process of retrieving data from the data source and the data which is extracted from the source system is unstructured in nature. Extracted data contain noise and irrelevant attributes to remove this, data need to be preprocessed. It is procedure to retrieve the data which is generated by the users through internet or by some applications.

Framework for Data Extraction through Social Sites

It is the framework of data extraction through social site, in the process of extraction there are five steps procedure. In first step request is sent to the database server by data crawler for the access token. After receiving the request from the data crawler, database server reply-back with access token. As the data crawler receives the access that token is used by the tool and data is extracted. The data which is extracted is in the form of unstructured data. Fourth step is to preprocess the data by manually as per the need. In last step useful data is received and used for the work.

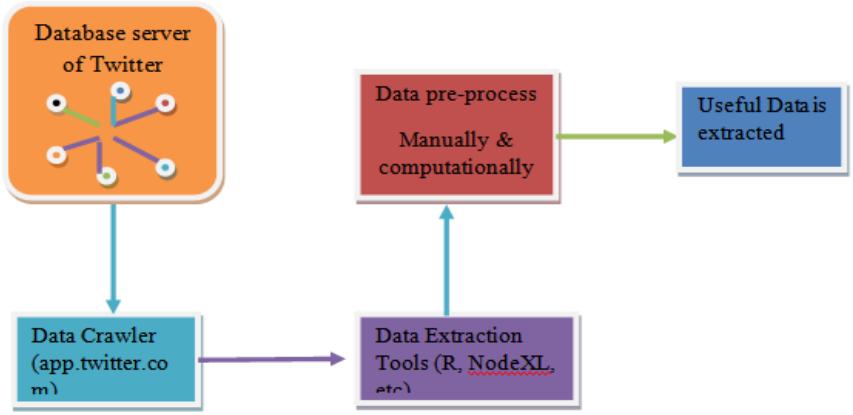

Fig 1: Framework of data extraction.

Flow Chart

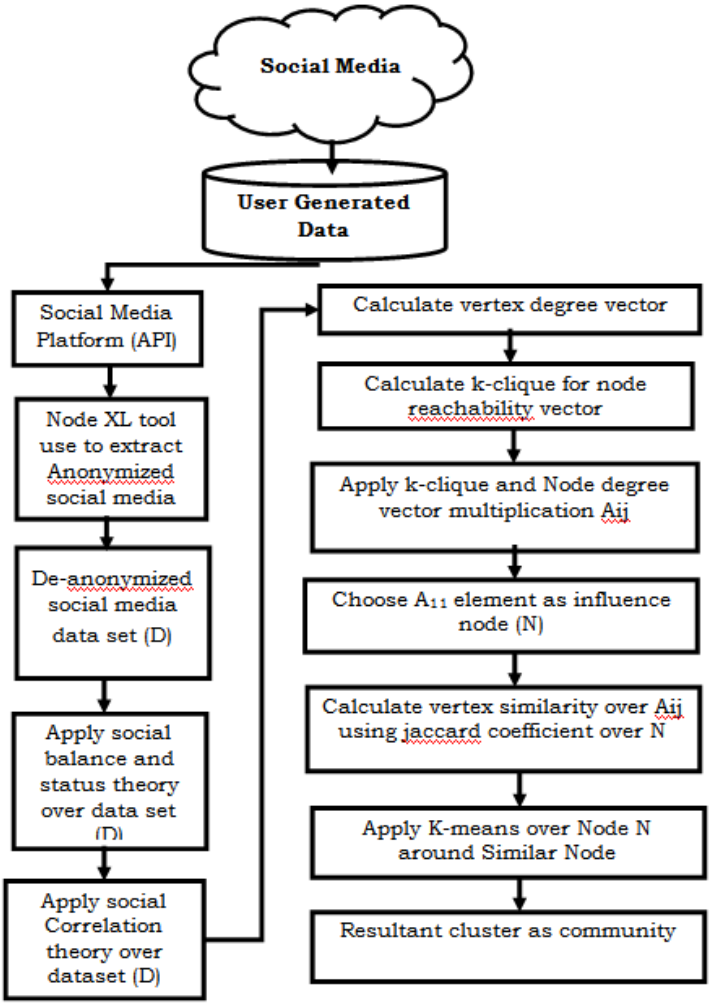

Fig 2: Flow chart.

IV. Result Analysis

Evaluation measures are the parameter through which communities detected by the algorithm is as per the ground truth or not. We have used modularity as our evaluation parameter. Modularity is one measure of the structure of networks or a graph which is designed to measure the strength of division of a network into modules called groups, clusters or communities. Networks having dense connections between the nodes within modules have high modularity than the sparse connections between nodes in different modules. Modularity is also used in optimization methods to detect community structure in the networks. Modularity is one such measure, which when maximized, leads to the appearance of communities in a given network. The value of the modularity lies within the range [−1/2, 1). If the number of edges within groups exceeds the expected number on the basis of chance it is positive. Example of modularity by using tweets of the twitter.

The experimental setup for community detection on different dataset by two algorithms is; Pentium 4 machine, 1800MHz, 1GB RAM, Windows 2007 with graphics, R-studio and Dataset should be preprocessed. hedre, we report the results of experiments on the Social network dataset described in Table 1:

Table 1: Modularity of Community Detection algorithms on Social Network Datasets.

[1] **DATASETS**	[2] **Walktrap**	[3] **Fastgreedy**	[4] **Edge betweenness**
[5] **KARATE**	[6] 0.353222	[7] 0.380671	[8] 0.4012985
[9] **DOLPHINS**	[10] 0.488845	[11] 0.495491	[12] 0.5193821
[13] **FOOTBALL**	[14] 0.602914	[15] 0.549741	[16] 0.599629

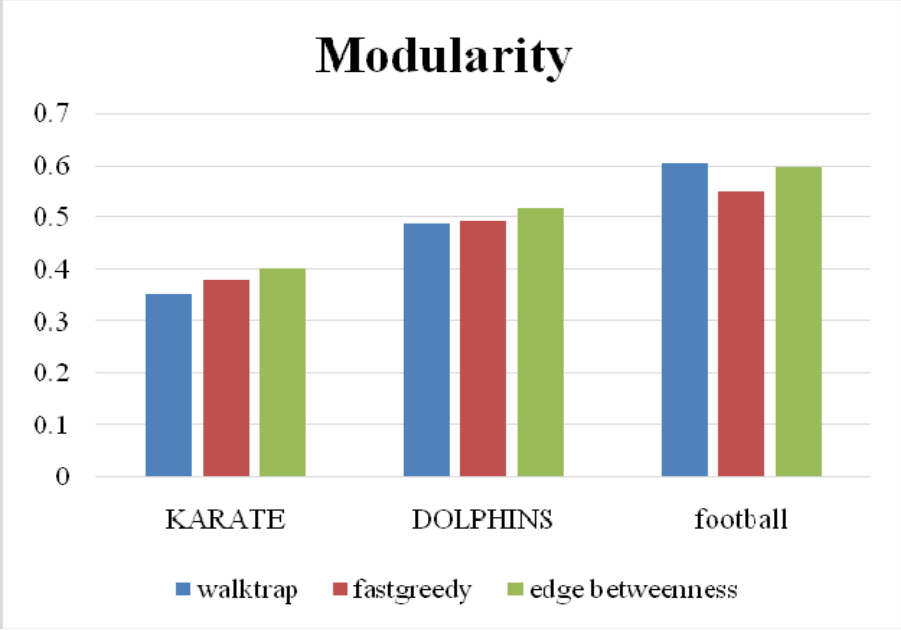

Fig 3: Results of Modularity for comparison algorithms.

Table 2: Results of Execution Time**.**

[17] **DATASETS**	[18] **Walktrap**	[19] **Fastgreedy**	[20] **Edge betweenness**
[21] **KARATE**	[22] 0.00399	[23] 0.00298	[24] 0.004987955
[25] **DOLPHINS**	[26] 0.00398	[27] 0.002	[28] 0.01478505
[29] **FOOTBALL**	[30] 0.00399	[31] 0.00499	[32] 0.2853062

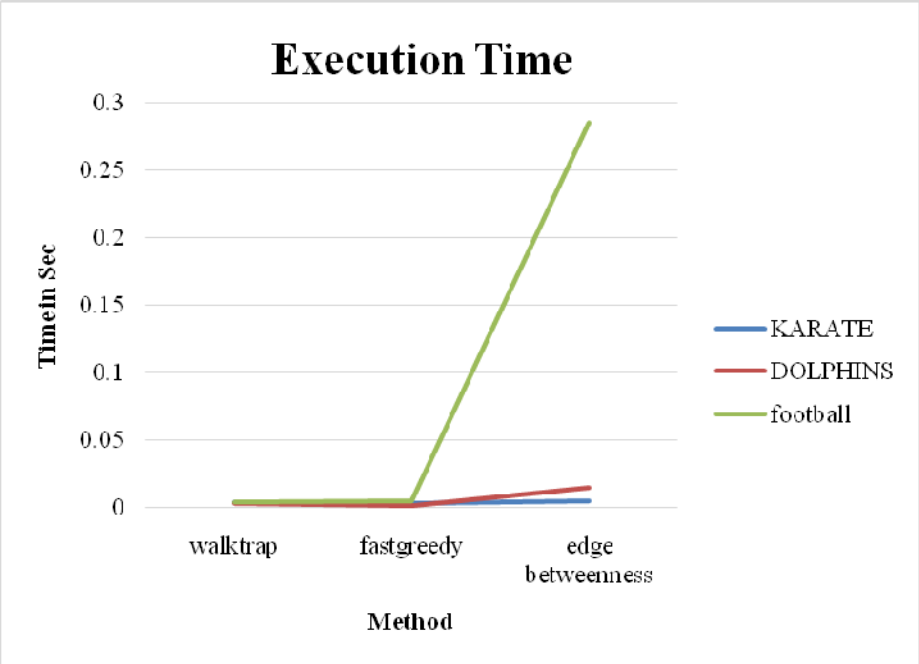

Fig 4: Results of Execution time for Comparison algorithms.

Table 3: Results of Modularity with Twitter Data Set.

Dataset	Walktrap	Fastgreedy	Edge Betweenness	Proposed Method
Twitter	0.6129143	0.559731	0.609128	0.629128

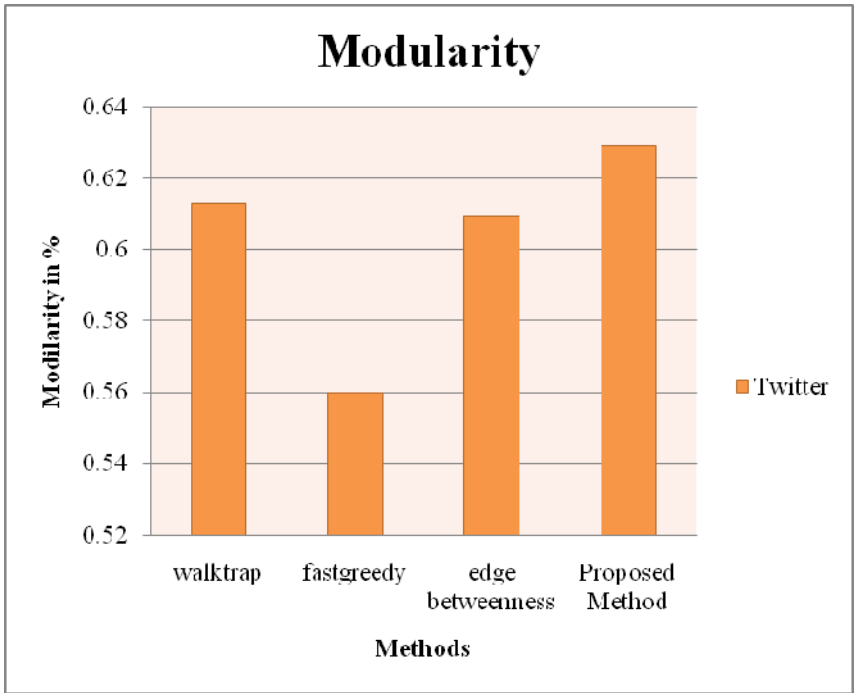

Fig 5: Modularity for with Proposed Approach.

V. Conclusion

Social media is an important part of human's social life. Nature of the human being is positive and negative. As it is known that there are many human beings uses technology for the positive purpose and some uses for the negative purpose too. User creates their profile on the social media by providing their personal information. This information can be hacked by the third party and used for the creation of fake profile. Some users provide their false information at the time of profile creation and they create communities/group to circulate malicious information. To detect such communities/group researcher start working on the social media data. There are different types of research fields of social media data. Social media generated huge amount of user-content. The user-generate content is used for many research work in the field of social media. Community detection is one of the emerging fields of the social media mining. Researcher has done a lot of work in community detection. Major issues of community detection are scalability and quality of the community. Some of the algorithm scalable in large network and provides better results as compare to other algorithm. We have compared the algorithms on the social data of the twitter. As result it is prove that algorithms are scalable in the large network as per the evaluation parameter. The unique feature of this thesis is that we have evaluated all the features of the algorithm on the large social network.

References:-

1. Qiuling Yan , Shaosong Guo, Dongqing Yang Advanced Data Mining and Applications Volume 7121 of the series Lecture Notes in Computer Science pp 82-95

2. Tang, Lei, and Huan Liu. "Community detection and mining in social media." Synthesis lectures on data mining and knowledge discovery 2.1 (2010): 1-137.

3. Social media mining by Reza Zafarani and Mohammad Ali Abbasi (http://dmml.asu.edu/smm,)

4. Authors: A. Lancichinetti and S. Fortunato. Presented by: Ravi Tiwari (https://www.cise.ufl.edu/research/OptimaNetSci/slides/22Apr'10.ppt)

5. Kafeza, Eleanna, et al. "T-PICE: Twitter personality based influential communities' extraction system." Big Data (BigData Congress), 2014 IEEE International Congress on. IEEE, 2014.

6. Jiang, Fei, et al. "A uniform framework for community detection via influence maximization in social networks." Advances in Social Networks Analysis and Mining (ASONAM), 2014 IEEE/ACM International Conference on. IEEE, 2014.

7. Barbieri, Nicola, Francesco Bonchi, and Giuseppe Manco. "Influence-based network-oblivious community detection." Data Mining (ICDM), 2013 IEEE 13th International Conference on. IEEE, 2013.

8. Wang, Wenjun, and W. Nick Street. "A novel algorithm for community detection and influence ranking in social networks." Advances in Social Networks Analysis and Mining (ASONAM), 2014 IEEE/ACM International Conference on. IEEE, 2014.

9. Sathanur, A.V.; Jandhyala, V.; Chuanjia Xing, "PHYSENSE: Scalable sociological interaction models for influence estimation on online social networks," in Intelligence and Security Informatics (ISI), 2013 IEEE International Conference on, vol., no., pp.358-363, 4-7 June 2013 doi: 10.1109/ISI.2013.6578858

10. Li, Jinshuang, and Yangyang Yu. "Scalable influence maximization in social networks using the community discovery algorithm." Genetic and Evolutionary Computing (ICGEC), 2012 Sixth International Conference on. IEEE, 2012.

11. Maiti, Saptaditya, Deba P. Mandal, and Pabitra Mitra. "Detecting influential users using spread of communications." Intelligent Computational Systems (RAICS), 2013 IEEE Recent Advances in. IEEE, 2013.

12. Chintalapudi, S. Rao, and MHM Krishna Prasad. "A survey on community detection algorithms in large scale real world networks." Computing for Sustainable Global Development (INDIACom), 2015 2nd International Conference on. IEEE, 2015.

13. Mursel Tasgin, Amac Herdagdelen, Haluk Bingol (Submitted on 4 Nov 2007)

14. J. Yang, J. McAuley and J. Leskovec, "Community Detection in Networks with Node Attributes," 2013 IEEE 13th International Conference on Data Mining, Dallas, TX, 2013, pp. 1151-1156. doi: 10.1109/ICDM.2013.167

15. Fortunato, Santo. "Community detection in graphs." Physics reports 486.3-5 (2010): 75-174.

16. Malliaros, Fragkiskos D., and Michalis Vazirgiannis. "Clustering and community detection in directed networks: A survey." Physics Reports 533.4 (2013): 95-142.

17. Gong, Maoguo, et al. "Community detection in networks by using multiobjective evolutionary algorithm with decomposition." Physica A: Statistical Mechanics and its Applications 391.15 (2012): 4050-4060.

18. Shen, Huawei, et al. "Detect overlapping and hierarchical community structure in networks." Physica A: Statistical Mechanics and its Applications 388.8 (2009): 1706-1712.

19. Xing, Yan, et al. "A node influence based label propagation algorithm for community detection in networks." The Scientific World Journal 2014 (2014).

20. Bonchi, Francesco. "Influence Propagation in Social Networks: A Data Mining Perspective." IEEE Intelligent Informatics Bulletin 12.1 (2011): 8-16.

21. Yoonseop Kang, Seungjin Choi Neural Information Processing Volume 5863 of the series Lecture Notes in Computer Science pp 175-184

22. Eleanna Kafeza, Andreas Kanavos, Christos Makris , Dickson Chiu Volume 8697 of the series Lecture Notes in Computer Science pp 7-13

23.http://www.defence.gov.au/pathwaytochange/docs/socialmedia/1.%20Social%20media%20and%20its%20origins%20SM.pdf.