

INSTITUTION SYSTEM ANALYSIS BY USING SIMILARITY BASED CLUSTERING ON SOCIAL NETWORK ACCESS

Vinothan Damodaran and Saravanan, M.

Department of Computer Science, Sathyabama University, Chennai, India, vinothand814@gmail.com
Department of Computer Science, Sathyabama University, Chennai, India, mail2saravananme@gmail.com

ABSTRACT

The SNA (social network analysis), branch of difficult systems can be utilized in the construction of multi-agent systems. This paper proposes a Institutional system using SNA network analysis which can assist in modeling multi-agent systems, when addressing similarities and differences among the two theories. We fabricated a model of multi-agent systems for determination of errands through the development of groups of agents that are shaped on the social's premise system built up between agents. Agents make utilization of execution pointers to survey when ought to change their social network to expand the support in groups. There are two issues on that we tend to focus during this paper. the primary one is to seek out the intrinsic institution network structure and other is to check funding policies within the previous years and search for the optimum policy. So, to overcome on this issue, we proposed the similarity based clustering for categorize the institution dataset, and this procedure utilizes a multi-agent system, it is constructed on agent interactions. As well as searching for feasible association between student performance and funding policies. After cluster the datasets, then it's stored into Databases based on highest similarity. Also in this system mainly focuses to user (i.e. student, teacher, others) etc. retrieves the top most order institution from the DB. At last, Institution will know the quality of their colleges, when compared to other Institution of highest similarity of Institution.

Keywords—*social network, agglomerative hierarchical clustering, agent interactions*

I. INTRODUCTION

India's teaching system is full of British model. Essential and facultative studies is 10 years in term, trailed by 2 years of elder auxiliary studies (identical to fulfillment of higher secondary school completion in United States of America). Advanced studies begins when fruits of Year twelve and for the foremost half obliges 3 years of college education to win the Bachelor degrees(BA,Bsc,Bcom). Specialist degrees in subjects, for instance, agriculture ,medical ,engineering, law, dental will take between 4 to 5 years of completion of revered degree's. The nature of Engineering education among Indians is inadequate with regards to because of numerous issue such has not having an adequate Infrastructure of college, quality of showing staff and understudy education execution more depend on the hypothetical part as opposed to functional method for learning. Many exploration have been done in the field. There are likewise numerous variables that have been inferred in examination, for example, school decision , instructor quality ,Institution quality, financing approach, and so forth. In this way past examination in the field basically concentrated on the effect of maybe a couple of those variables on Institution, the end product they will gave is forced as a result of completely different reason..

College systems contains numerous agents that speak with one another to frame a social network[2]. A social network is an arrangement of individuals (or associations or different substances) joined by an arrangement of socially-important connections. Establishment system, which is an arrangement of a wide range of performing artists, for example, understudies, educators, and so forth., is a social network[2]. There may be basic group structure inside of a system, which is the division of system hubs into groups inside which organize associations are thick.

Accordingly discovering group structure is critical for comprehension inborn structures for complex net-

works.The real reason for this task is to check social networks with a stress on social intercommunications by utilizing a multi-agent approach.. There are for the most part two objectives: The utmost is to recognize hierarchical group structure in social networks by utilizing an agglomerative hierarchical algorithm[2]. Existing hierarchical algorithms normally use some operation based on similitude or dissimilitudeof two clusters by ascertaining with a few procedure of separation between sets of perceptions. let, be that as it may, build up a strategy which computes similarity based on social intercommunications, which is perfect for social networks[2].

The next one is to study how financing policies can possibly affect organization performance. In the institution system network, however funding is issued in institution system could be a important matter,but, researches within the subject haven't been ready to draw any range accomplishment nonetheless.

This work intends to coordinate the procedures of multi agent systems and social network analysis, permitting an agent society make utilization of Similarity Based Clustering measurements in the choice making procedure considering traits, for example, the position in the system and the worth and the significance of an agent in the system. Since procedure utilize the social component, the agent, the collaboration between them will permit simple utilization of models taking into account social system examination so that the multi-agent systems turn out to be more solid in the representation of social wonders. For this, an application was created speaking to procedure of selecting groups for fathoming errands in a multi-agent society, in which agents have particular aptitudes and their position in the social network will impact their execution in the multi-agent society.[2]

II. RELATED WORKS

It is usually recognized that encouraging educator standard is additionally an important half in up ultimate and instruction within the U.S.. Certainly, each of the first goals of the No kid Left Behind law is to possess a “highly qualified teacher” in every room. Although ten years of study, however, there's not any agreement on what aspect exalt, or perhaps signal, educator standard. we tend to centre here on the link between educator capacity and educator employment, similarly as traditional pre-service university education, in-service masterly progress, and natural implementation intrinsic through at the job occurrence. precursory analysis on educator employment has produced extraordinarily inconsistent results and has charged an oversized vary of policy instruction. Part of studies understand that conventional education is significant and these square measure taken as reinforce for nourishing existing educator readiness programs in colleges and expanded uses on post college employment. Similarly basic, notwithstanding, is that the finding that conventional instruction is unessential, driving others to contend for the disposal of resources of studies[3]. Trust are viewed at constant time as degree instrument every for degree agent selecting the proper partners thus on understand its own goals, associate degree for associate degree agent of being elect from completely different Potential partners thus on verify with them a cooperation/collaboration and to want advantage from the accumulated trust[4].

The dataset holds adequate email capacity and majority to produce us with terribly helpful outputs if we tend to have an interest in knowing however structure varies over time. By variable the quality weights it's doable to utilize the intimated limitation. discover the foremost vital individual(s) in a company, cluster people with indistinguishable social/email standard, and diagrammatically produce a company chart that about simulates the important social hierarchy in question[5]. one amongst the foremost effectual technique in hierarchical reinforcement learning is the MAXQ technique initiated in . though this technique is displays to be effectual in numerous applications, it's mathematically valuable in applications with intense hierarchy, that produces it unfeasible to be utilized in similar applications[6]. hierarchal reinforcement learning (HRL) is AN rising sub discipline throughout that reinforcement learning methods square measure accrued with previous knowledge regarding the high-level structure of behavior[7]. Community analysis algorithmic program finds community structure in social networks and recognize that this inability is generated from unifying communities in unstable technique[8]. The association between educator capacity and educator coaching job, beside conventional pre-employment university education, in-employment delicate evolution, and normal coaching job non inheritable through on the job occurrence[9].

III. THE APPROACH

A. Agglomerative Hierarchical clustering Algorithm

Agglomerative Hierarchical clustering - This calculation lives up to expectations by gathering the data one by one on the premise of the closest separation measure of all the pair wise separation between the data point. Again separation between the data point is recalculated yet which separation to consider when the gatherings has been framed? For this there are numerous accessible techniques. Some of them are

Started with the disjoint agglomerative clustering having level $L(0) = 0$ and sequence number $m = 0$.

Along these lines we continue gathering the data until one group is shaped. Presently on the premise of dendrogram graph we can figure what number of number of clusters ought to be really present.

Find the slightest unique pair of clusters in the present clustering, the pair $(u), (v)$, stated to $d[(u),(v)] = \min d[(a),(b)]$ where the minimal is altogether sets of clusters in the present clustering.

Increase the sequence number: $n = n + 1$.

Combine clusters (u) and (v) into one cluster to make consecutive agglomeration m . Set the level of this clustering to $L(n) = d[(u),(v)]$.

Revise the distance matrix D , by removing the rows and columns comparable to clusters (u) & (v) and joining a row and column area unit comparable to the freshly created cluster..

The distance between the newly created cluster, denoted (u, v) and former cluster (k) is described in this method: $d[(k), (u, v)] = \min d[(k),(u)], d[(k),(v)]$

If every objects are in one set of cluster, then stop.

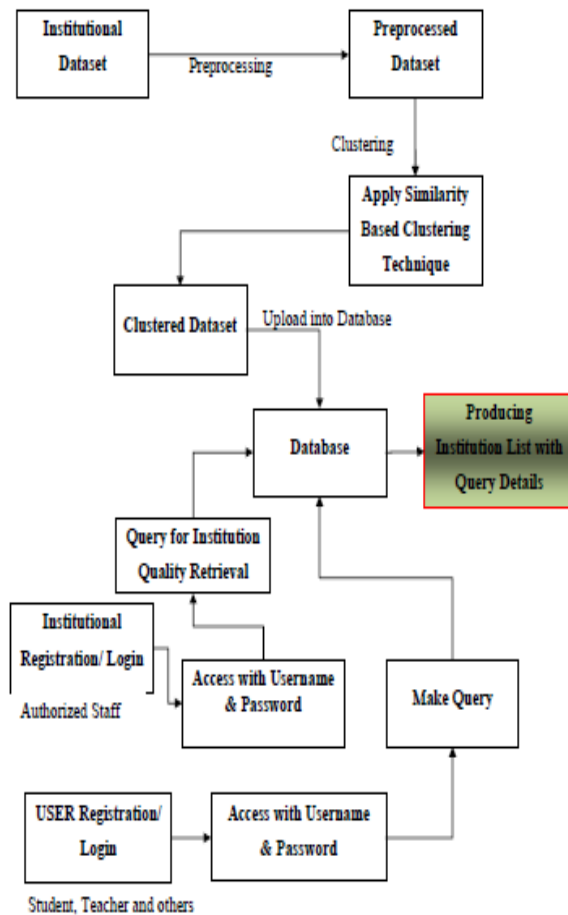
Else, visit the step two.

After the step wherever nodes are clustered into their 1st cluster, that uses node similarity d , we tend to modify clusters directly. we tend to use average linkage, that is that the averagesimilarity between all pairs of nodes within the 2 clusters, to calculate cluster similarity:

$$\delta(a_i, b_i) = \frac{\sum a \in a_i \sum b \in b_i . d(a,b)}{|a_i| \times |b_i|}$$

where a_i and b_i are the cluster pair and a and b are nodes within them.

B. Overall Architecture



IV. EXPERIMENTS AND RESULTS

We process a Institutional college system network by implementing actual college information provisioned by some of affiliated colleges under Anna University. Actually we focus on Engineering Education In Tamil Nadu state of India where more number of engineering colleges are providing education. As per the Accredited AICTE ,NAAC and NBA (Accredited Courses)for University and colleges forms the structural qualification for the Institution and sustains an revised directory of duplicates Institution on their websites. AICTE sustains an analogous e-directory of subjects and establishments that provide engineering studies certificate while not getting required authorization from the Committee. It conjointly issues elaborated directory of colleges that are granted by AICTE for organizing schedules unitedlywith overseas universities or institutions and people that are running unauthorized schedules.

In Tamil Nadu Anna University is the government engineering University which has affiliated colleges of around 530 Engineering colleges to get into top among these colleges with all aspects of education.

The above mentioned figure 1.is presenting the clustering accuracy comparison within several existing technique. The proposed Similarity based clustering algorithm simulation result is producing better result of clustering in compare to other techniques.

quality and infrastructure is difficult for student. To overcome this difficulty in choosing best engineering college and help the student and parents to guide for better future this project deals with aspect of ranking based on the passing percentage of the college which tops among them. This project also deals with obtaining a well equipped college to grow in engineering education by suggesting top quality of top colleges and finding the lack of infrastructure to the Under developing colleges and also calculating the funding policy has per the Anna University reducing the college fee for the student who is attending through counseling quota.

The Similarity Based Clustering system has been proposed in this project that provides a clustered dataset to upload in the database. Cluster analysis is anpredominantcomponent of involving exploration data analysis. It is usually handled to review the intramural formation of a complicated data set, which cannot be detailed only by the classical second order stats. Using social dependence networks to represent the multi agent system, allows us to model, particularly for the requirements analysis phase of the design process of the institution details.

The motive of this project is to research the shape of social networks with a anchor on social interactions by identifyingcritical hierarchical structures. The identified formation of social networks is then utilized to help assess their institution accomplishment. creation of an institutional dataset with several details like funding schemes, structure and standard of the particular institute. After that the preprocessing process is applied for removing the null value from the dataset.creation of an institutional dataset with several details like funding schemes, structure and standard of the particular institute. After that the preprocessing process is applied for removing the null value from the dataset.

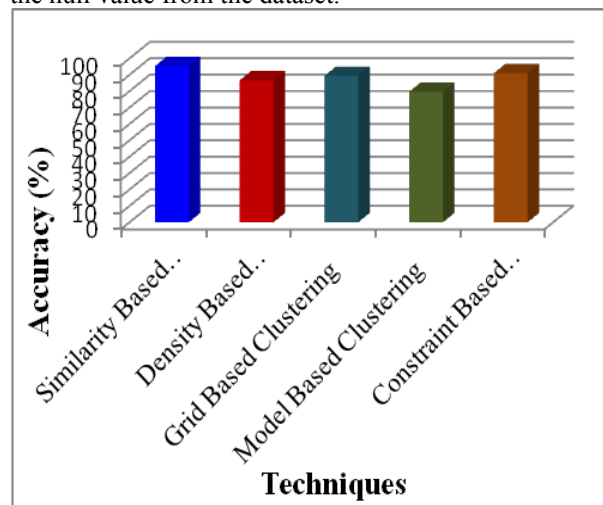


Fig 1 Clustering Accuracy Performance



Fig 2 Ranking Graph of Overall Pass Percentage

The above figure 2. Representing a ranking graph of colleges regarding their semester wise passing percentage and their overall pass percentage is generated through the dataset of pass percentage of each department.

V. CONCLUSION

In present day, several attempts are dedicated into multi agent structure and social network interaction. Several processes have well-tried that multi agent system could be a sensible tool for social network analysis. This task is useful to social network analysis and multi agent system. We tend to specialize in modeling social networks victimization multi-agent systems with a spotlight on social interactions. By executing an actual institution network to assess funding policies of previous years of institutions and make the student performance in studies by choosing better ranked colleges with the data of passing percentage, fee structure, facility of college.

REFERENCES

- [1] Klügl, F., and L. C. Bazzan, Agent-Based Modeling and Simulation. *AI-Magazine* Pp. 29-40 (2012).
- [2] Lizhu Ma, Social Network Analysis Using a Multi-agent System: A School System Case, Computer Science Honors Thesis (2013).
- [3] D. Müllner, Modern hierarchical, agglomerative clustering algorithms, *ArXiv.org*. Pp. 1-29 (2011).
- [4] G. Andrighetto, G. Boella, J. Sichman, and H. Verhagen, Social networks and multi-agent systems symposium (SNAMAS-09) introduction, *Proceedings of the SNAMAS Symposium* Pp. 1-3 (2009)
- [5] G. Creamer, R. Rowe, S. Hershkop and S. J. Stolfo, Segmentation and automated social hierarchy detection through email network analysis, *Advances in Web Mining and Web Usage Analysis* Anonymous Springer Pp. 40-58 (2009)
- [6] K. Wakita and T. Tsurumi, Finding community structure in mega-scale social networks, *Proceedings of the 16th International Conference on World Wide Web*, Pp. 1275-1276 (2007).
- [7] B. Marthi, S. Russell, D. Latham and C. Guestrin, Concurrent hierarchical reinforcement learning, *Proceedings of the National Conference on Artificial Intelligence*, Pp. 1652 (2005)
- [8] F. Mirzazadeh, B. Behsaz and H. Beigy, A new learning algorithm for the maxq hierarchical reinforcement learning method, *International Conference on Information and Communication Technology (ICICT'07)*, Pp. 105-108 (2007).
- [9] D. N. Harris and T. R. Sass, Teacher training, teacher quality and student achievement, *Journal of Public Economics* **95**: 798-812 (2011).
- [9] D. Clark, P. Martorell and J. Rockoff, School principals and school performance, *Technical Report* (2010).
- [10] F.E. Crampton, Spending on school infrastructure: does money matter? *Journal of Educational Administration* **47**: 305-322 (2009).
- [11] T. G. Dietterich, Hierarchical Reinforcement Learning with the MAXQ Value Function Decomposition. *Journal of Artificial Intelligence Research* **13**: 227-303 (2000)
- [12] S. Fortunato, Community detection in graphs, *Physics Reports* **486**: 75-174 (2010).
- [13] R. Gutierrez-Osuna, Pattern analysis for machine olfaction: a review, *Sensors Journal, IEEE*, **2**: 189-202 (2002).
- [14] A. K. Jain, Data clustering: 50 years beyond K-means, " *Pattern Recog. Lett.* **31**: 651-666 (2010).
- [15] D. Jiang, C. Tang and A. Zhang, Cluster analysis for gene expression data: A survey, *Knowledge and Data Engineering, IEEE Transactions* **16**: 1370-1386 (2004).
- [16] C. Lubienski and S. T. Lubienski, Charter, private, public schools and academic achievement: New evidence from NAEP mathematics data, *Occasional Paper*, Pp. A12 (2006).
- [17] M. Marchiori and V. Latora, Harmony in the small-world, *Physica A: Statistical Mechanics and its Applications* **285**: 539-546 (2000).
- [18] K. J. Meier, L. J. O'Toole Jr and H. T. Goerdel, School superintendents and school performance: Quality matters, *Technical Report* (2003).
- [19] M. E. Newman, The structure and function of complex networks, *SIAM Rev.* **45**: 167-256 (2003).
- [20] M. E. Newman, Scientific collaboration networks. II. Shortest paths, weighted networks, and centrality, *Physical Review E*, **64**: 016132 (2001).
- [21] M. E. Newman and M. Girvan, Finding and evaluating community structure in networks, *Physical Review E*, **69**: 026113 (2004).
- [22] Parr, Ronald, and Stuart Russell. Reinforcement Learning with Hierarchies of Machines. *Advances in neural information processing systems*, Pp. 1043-1049 (1998).
- [23] S. Rangeon, W. Gilbert and M. Bruner, Mapping the World of Coaching Science: A Citation Network Analysis (2010).
- [24] J. E. Rockoff, The impact of individual teachers on student achievement: Evidence from panel data, *Am. Econ. Rev.* **94**: 247-252 (2004).
- [25] S. E. Schaeffer, Graph clustering, *Computer Science Review*, **1**: 27-64 (2007).