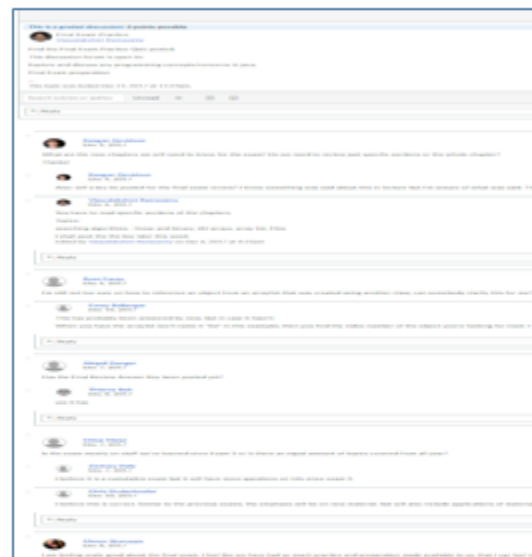




TP-GraphMiner Framework for Analyzing Information Network

LMS Discussion Forums based on assignments and course materials



Unstructured Data
Discussion Board
Threads

Data Preprocessing

Data fields
Key-word/ topic-
based/actor-based

Relational Data
Repository

Graph/Network
Database
(Neo4J)

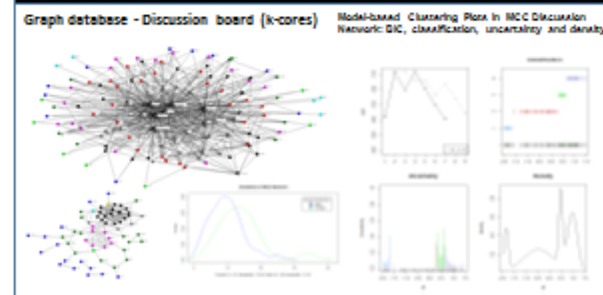
Feature Extraction

Role, Discussion Board
topic, Source/Sink of
threads, Type of
interaction, corpus of
keywords

Network Data Analysis

Thresholding correlation network
using MCC Algorithm,
Selection of clustering technique,
Model-based clusters,
Pattern identification

Results and Visualization



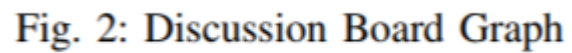


TABLE V: Discussion Board Data: Percentage Distribution of Male Vs. Female

Variables	N	Male	Female	% Distribution	
				Male	Female
Participated	116	98	18	89.09	94.74
Not Participated	13	12	1	10.91	5.26
Total Enrollment	129	110	19	100	100



Results & Analysis

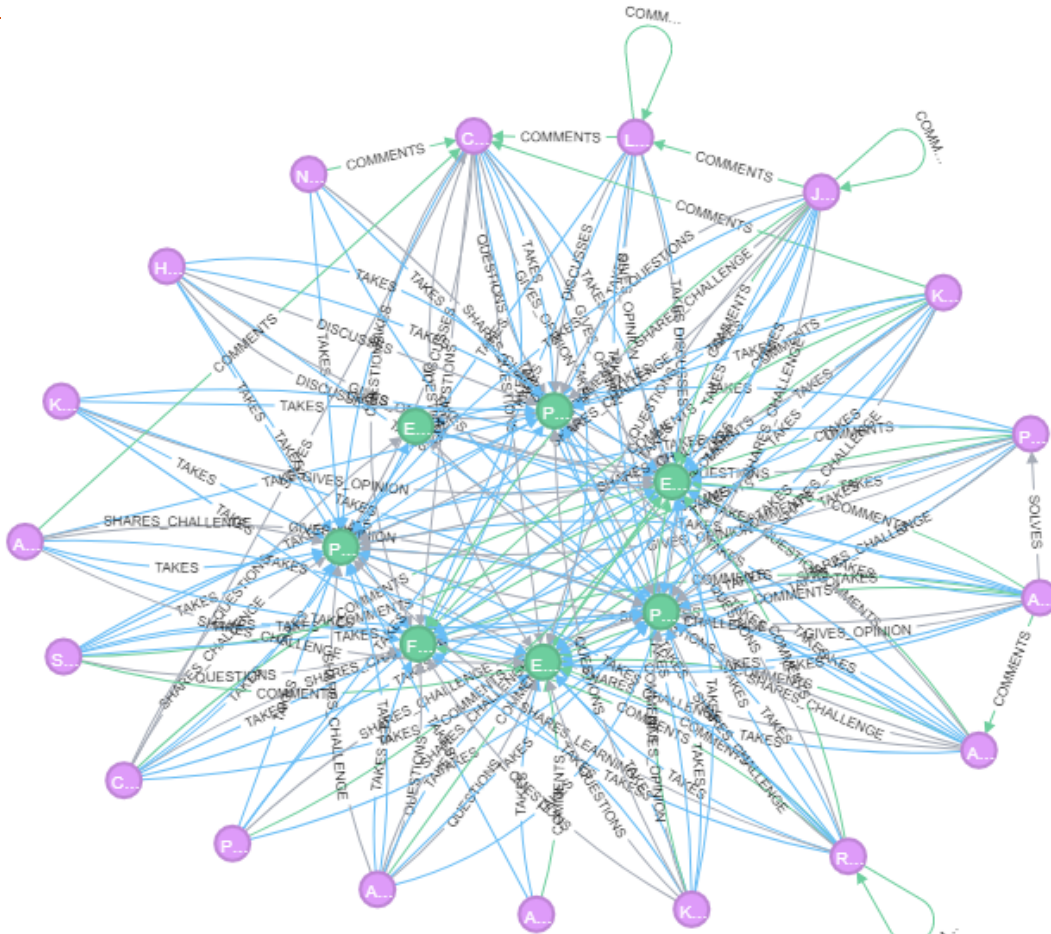


Fig. 3: Female Students' Discussion Network*

* Nodes: Green (Discussion Boards), Pink(Female Students), Edges: Type of Discussion

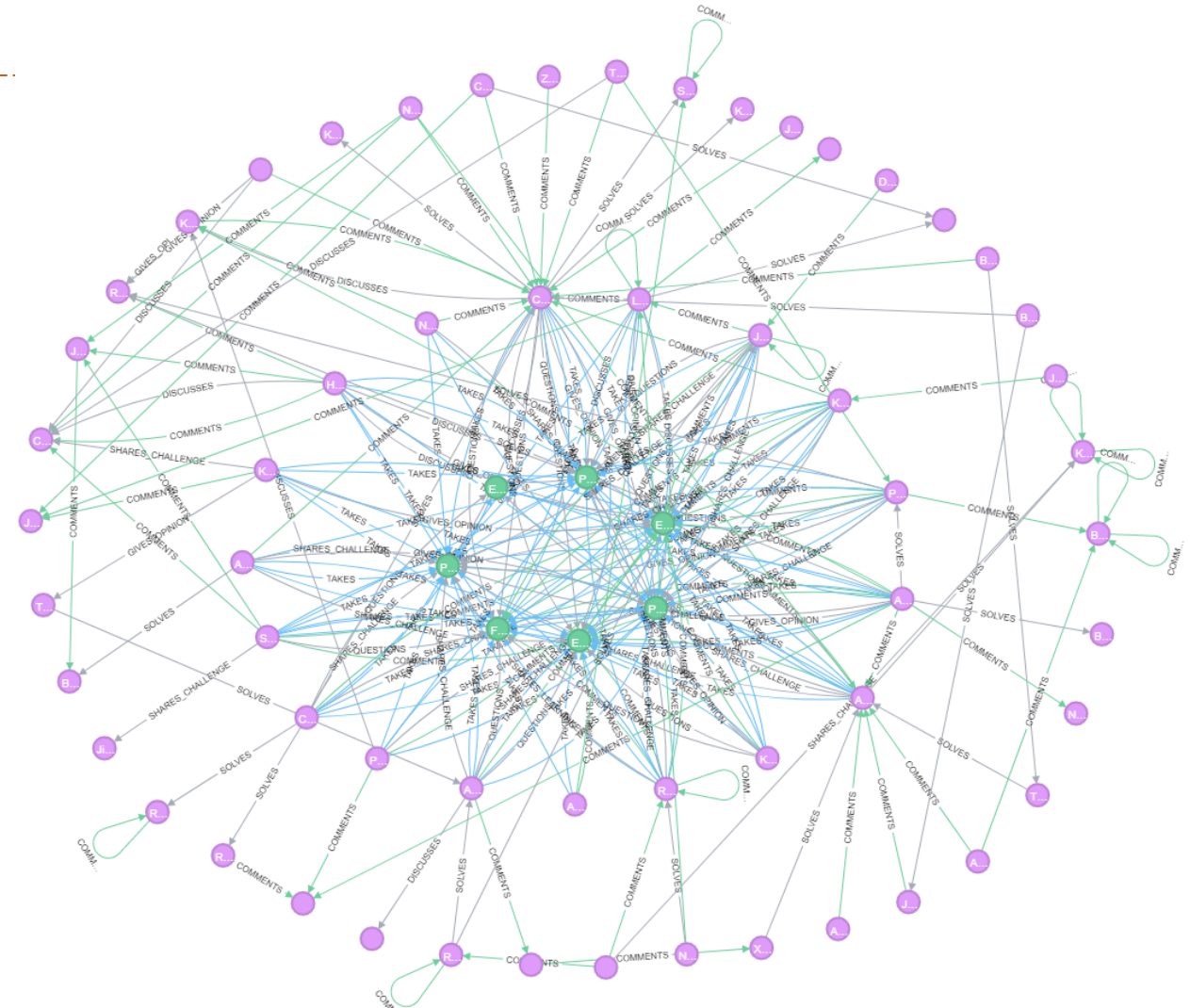
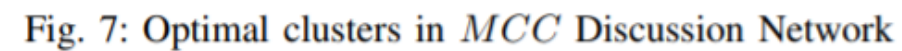
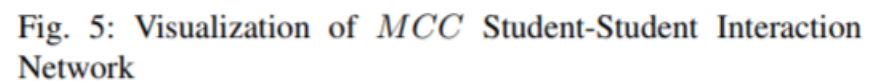


Fig. 4: Female Students' Interaction in the Overall Discussion Network



Types of Interaction

Domination

- nearly all power is concentrated in the hands of people of similar status

Cooperation

- power is equally distributed between people of different status

Competition

- power is unequally distributed, but the degree of inequality is less than in systems of domination



REFERENCES

- ▶ Agarwal, R., Imielinski, T. and Swami, A. Mining association rules between sets of items in large databases, in Proc. of ACM SIGMOD International Conference on Management of Data, pp. 207-216, 1993.
- ▶ Han, J. and Kamber, M. Data Mining: Concepts and Techniques, Morgan Kaufmann Publishers, San Francisco, 2006.
- ▶ M. Chen, J. Liu, X. Tang, Clustering via random walk hitting time on directed graphs, AAAI 08: Proceedings of the 23rd National Conference on Artificial Intelligence, Vol. 2, pp. 616621, 2008.
- ▶ Vijayalakshmi Ramasamy, N Rethnasamy, JF Roddick, M Thilaga, and P Nirmala, FP-GraphMiner-A Fast Frequent Pattern Mining Algorithm for Network Graphs, Journal of Graph Algorithms and Applications, Vol. 15, no. 6, pp. 753776, 2011.
- ▶ Vijayalakshmi Ramasamy, Naga Dasari, D Nandagopal, R Subhiksha, Bernie Cocks, Nabaraj Dahal, M Thilaga, Change Detection and Visualization of Functional Brain Networks using EEG Data, Vol. 29, pp. 672-682, 2014.
- ▶ Vijayalakshmi Ramasamy, Hakam Alomari, James Kiper and Geoffrey Potvin. A Minimally Disruptive Approach of Integrating Testing into Computer Programming Courses, Accepted in Second IEEE/ACM International Workshop, Gothenburg, Sweden, June 2, 2018.
- ▶ Vijayalakshmi Ramasamy, D. Nandagopal, N. Dasari, B. Cocks, N. Dahal, M. Thilaga, (2015) Minimum Connected Component - A Novel Approach to Detection of Cognitive Load Induced Changes in Functional Brain Networks, Neurocomputing 170: 15-31.

