

A novel classifier for multivariate instance using graph class signatures

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Frontiers of Computer Science, DOI: [10.1007/s11704-019-8263-5](https://doi.org/10.1007/s11704-019-8263-5)

Problems & Ideas

- Problems of using state-of-the-art classifiers for classifying multivariate instance having class signatures i.e. class-specific subsets of features and the relationship between these features.

- The state-of-the-art classifiers like NB, SVM, KNN, and ANN use complete feature vector for classification.
- Decision tree classifier produces class-wise subsets of features in the form of classification rules. However, none of these classifiers model the relationship between features, producing poor classification accuracy for such multivariate data.

- Ideas: Model multivariate instance as a connected graph.

- We propose to model multivariate data as connected graphs and learn the prominent class signatures in the form of discriminative subgraphs.
- We present two novel classifiers gMM and gSM using these signatures.

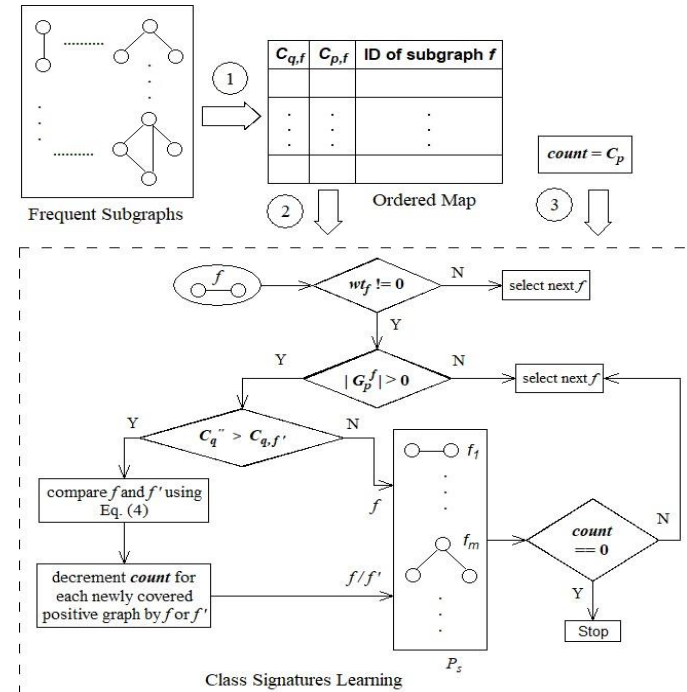


Fig 1: Phase I: Subgraph feature generation and class signatures learning

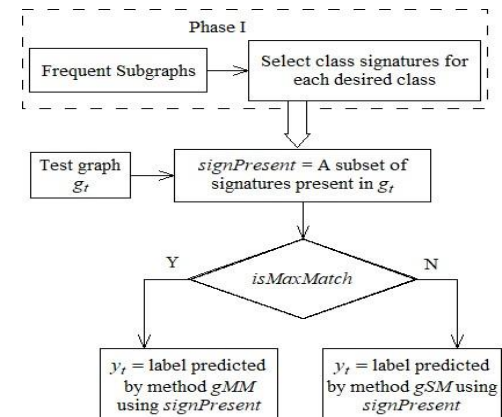
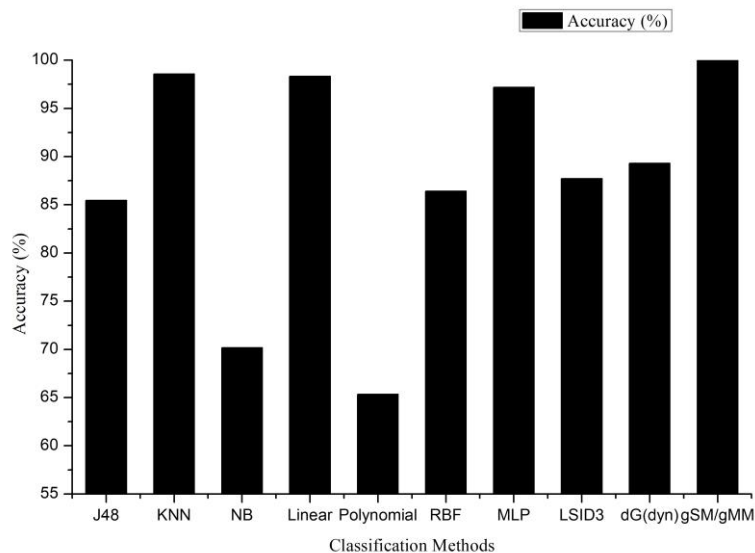


Fig 2: Phase II: Classification using key class signatures

Main Contributions

- Experimental results on various real-world and synthetic datasets confirm the ascendancy of the proposed class signatures based classifier compared to other established classifiers on most of the datasets.

- **Performance comparison on tic-tac-toe endgame data**



- **Performance comparison on synthetic buying patterns data**

