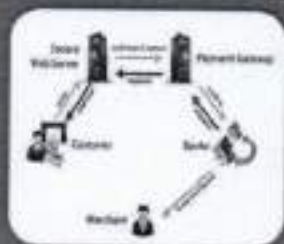


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Purna (Jn) Dist. Parbhani



# Design and development of novel techniques for clustering and classification of data using Data Mining for the implementation of algorithm

**Rajesh S. Walse**

School of Computational Sciences,  
Swami Ramanand Teerth Marathwada University, Nanded,  
India  
rajeshwalse@gmail.com

**Dr. Parag Bhalchandra**

School of Computational Sciences,  
Swami Ramanand Teerth Marathwada University, Nanded,  
India  
srtmun.parag@gmail.com

**Dr. G.D. Kurundkar**

Department of Computer Science,  
Shri Gurubuddhi Swami Mahavidyalaya, Purna Dist.  
Parbhani, S.R.T.M. University, Nanded, India  
gajanan.kurundkar@gmail.com

**Dr. S. N. Lokhande**

School of Computational Sciences,  
Swami Ramanand Teerth Marathwada University, Nanded,  
India  
lokhande\_sana@rediffmail.com

**Abstract**— The title of the Research topic is "Construction of Research Methodology on Literature Survey for the implementation of Algorithm designed for Clustering and Classification techniques in Data Mining Applications" In this paper proposed model of best clustering and classification of data set in the field of Agriculture, Dairy, Medical field using Data Mining techniques, in this paper on that basis Data mining techniques which is the best algorithm shows the accuracy of different data mining algorithms for better accuracy to compare with the other algorithms. In terms of applying and to develop new Algorithm in Data Mining Techniques.

In this paper in literature review, authors are used different standard data set from different platform like Crop, agriculture, seasonally calving dairy cows, Rice crop yield forecasting, Precision dairy farming, Kidney Disease, Chronic Kidney Disease analysis, Peritoneal dialysis patients, data set is different but above data analysis technique is the same in Data Mining and using some of the standard Machine Learning Algorithms for Clustering and Classification of data.

Clustering the data, people can obtain the data distribution, observe the character of each cluster and make further study on particular clusters. In addition, cluster analysis usually acts as the preprocessing of other data mining operations. Therefore, Cluster analysis has become a very active research subject in data mining. Data mining is a new technology developing with database and Artificial intelligence. It is processing procedure of extracting credible, novel, effective and understandable patterns from database. Cluster analysis is an important data mining technique used to find data segmentation and pattern information. As the development of data mining a

number of clustering methods have been founded, The Study of clustering techniques from the perspective of statistics based on the statistical methods with the computer algorithm techniques and introduces the existing excellent statistical methods including factor analysis, Correspondence analysis and functional data analysis into data mining. The present study is undertaken to develop a Data Mining workflow using clustering and classification of data to solving clustering problem as well as extracting potentially interesting association rules.

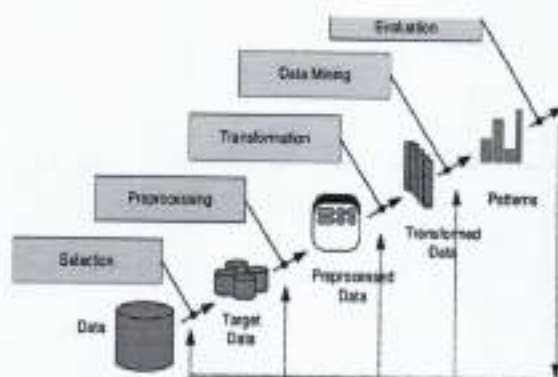
**Keywords**—Data Mining, Clustering, Classification, KNN, Weka, K-Means, INTRODUCTION

Many computer science techniques such as data mining and machine learning are used to study the influence of various parameters and make predictions of the on the basis of different data sets. Data mining is the process of identifying the hidden patterns from large and complex data. It may provide crucial role in decision making for complex not only agriculture but also health related problems.

A comprehensive review of the application of various techniques such as artificial neural networks, bayesian network, Support vector machines and association rule mining will be provided with examples to show how they have been applied to variety of agricultural data sets as well as to predict the Kidney disease health related issues and applied different techniques like SVM, ANN, Classification, DT, K-nearest clustering.



This paper reviews the application of data mining techniques applied in the different field. Recommendation for future research direction for the application, In this paper, various algorithms have been analyzed. Data mining is generally grouped as predictive and descriptive type. But in farming areas, predictive type is essentially used. The data mining techniques are Classification, Association rules, Clustering and Regression.



Data Fusion sampling multi-resolution analysis – De-noising Feature-Extraction  
Normalization -- Dimension reduction --  
Classification Clustering – Visualization Validation

Fig1: KDD Process in Data Mining

Data mining is the procedure of using huge data sets to infer important hidden knowledge. (fig.1) shows that knowledge discovery data mining process is divided into seven methods:

- ❖ Data cleaning
- ❖ Data Integration
- ❖ Data Selection
- ❖ Data transformation
- ❖ Data Mining
- ❖ Pattern estimation
- ❖ Knowledge display

## LITERATURE REVIEW:

2.1 Table: [A] Comparison of Different Data Mining Techniques

Sr no	Author	Applications	Algorithms/ Techniques used	Accuracy	Year	Research title	Methodology
1.	Antonio Robert o [1]	Data Mining in Landsat time Series	J48	95%	2012	Object based image analysis and data mining in landsat time series for mapping soybean in intensive agricultural regions[1]	All images were normalized through iteratively Re-weighted.
2.	Manish [2]	Data Mining, Association Rule Mining	Association Rules	---	2004	Optimization of Association Rule Mining using Improved Genetic Algorithms [2]	Algorithms are rate mining
3.	Carolyn Ferlon [3]	Data Mining	Logistic regression- in R- mixed logistic regression	96%	2016	Regression techniques for modeling conception in seasonally calving dairy cows [3]	To compare the performance f a logistic regression model applied to dairy conception with other binary mixed models
4.	Niketa Gandhi [5]	Data Mining, Decision tree, KNN	J48, LAD Tree	--	2016	Rice Crop Yield Forecasting of Tropical Wet and Dry Climatic Zone of India Using Data Mining Techniques [5]	Koopen classification applying various Data Mining Techniques, Weka, Data Visualization
5	Sabri [6]	Data mining, Association rule mining, segmentation, market analysis	Apriori	94%	2015	Segmenting customers with data mining techniques [6]	In the study, SPSS Clementine v12 was used to find the association rules from the dataset

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6	Zahid [7]	Data Mining, Auditory icon, visualization	RPAI, classification	--	2006	Sonification: A Novel approach towards Data Mining [7]	Tested our RPAI algorithm on the rain data, created 2D plot of the data
7	Kriti [8]	Edge Mining Techniques	Data compression algorithm	--	2016	Using edge analytics to improve data collection in Precision dairy farming [8]	Edge mining algorithms convert the raw data into state vector and reduce memory usage
8	Sanyam Bharara [10]	Knowledge management, Business M. business intelligence	DM techniques, KDD, Clustering, Classification	--		A review on knowledge extraction for Business operation using Data Mining [10]	Analyzing the information generated by the users, DM techniques like Classification, Clustering
9	R. Sujatha [15]	Data Mining, Classification algorithm, Crop, yield prediction	KDD, Naive bayes, J48, Random Forest, ANN, Decision tree SVM	--	2016	A Study on Crop Yield Forecasting Using Classification Techniques [15]	DM algorithms divided into three unique methods of learning called Supervised, unsupervised and semi supervised learning.
10	Chen Jinyin [22]	Data Mining, Clustering algorithm, Rapid determination of cluster centers, Density based clustering.	Clustering algorithm	91%	2017	A novel cluster fast determination clustering algorithm [22]	Density based clustering method proposed.
11	S. Dilli Arasu [23]	CKD, EPI, WAEI, EM, RF, CART, C4.5	Priority assigning algorithm	--	2017	A novel imputation method for effective prediction of coronary kidney disease CKD [23]	Kidney disease is predicted from clinical database by WAEI technique
12	Zou [24]	Peritoneal dialysis patients, Clustering analysis, syndrome evaluation law	SPSS18.0 Clustering analysis	50 %	--	Application of clustering analysis to explore syndrome evolution law of peritoneal dialysis patients [24]	TCM syndrome diagnostic criterion, information collection content and time point, data analysis and criterion syndromes.
13	Veenita [25]	Data mining, Classification, Chronic Kidney disease, naive Bayes, Artificial Network	Naive Bayes, ANN, (classification algorithm)	ANN-72.73 % Naive Bayes-100%	2016	Chronic Kidney disease analysis using data mining classification techniques. [25]	Data collection, preprocessing, applying classification algorithm naive bayes and ANN then model test the data and data is then transformed into suitable format for further processing. DM applied on the data to extract valuable information.
14	[26] Duc Thanh Anh Luong Dept. of Comput. Sci. & Eng., Univ. at Buffalo Buffalo, NY, USA	L-Means, Clustering, Chronic Kidney Disease	Clustering disease progressions, time series data, disease progression profiles, healthcare analysis, disease progression data, Chronic Kidney Disease, unsupervised machine learning, K-means approach	-	2017	1. A K-MEANS APPROACH TO CLUSTERING DISEASE PROGRESSIONS [26]	We use the algorithm to group patients suffering from Chronic Kidney Disease (CKD) based on their disease progression profiles. A qualitative analysis of the representative profiles for the learnt clusters reveals that this simple approach can be used to identify groups of patients with interesting clinical characteristics.



15	Narander [27]	Data Mining, Classification, Clustering, Healthcare, WEKA	J48, Random forest, Naive Bayes Classifier, SVM, KNN / Linear Regression, Multivariate Linear Regression, Non Linear Regression	Knn-95% RF-100% NB-95% J48-99% SVM-62%	2017	Implementing WEKA for Medical data Classification and early disease prediction[27]	Experiment has been conducted CKD data set, implemented various classification algorithm
16	Issariya [28]	Acute kidney injury, Acute Kidney Injury (AKI), Data Mining, Decision Tree, Classification, KDIGO-Kidney Disease Improving global Outcomes	Decision Tree Classification technique, J48, Simple Cart	--	2016	AKI Helper: Acute Kidney Injury diagnostic tool using KDIGO guide line approach	Identifying the risk factors of AKI using data mining techniques

### Work Flow Diagram:



### 3 MATERIALS AND METHODS:

**Data Collection** – The data used for this work was collected from specific region. Following stages of the research applied on collected data: Data cleaning, Data selection, Data Transformation and data Mining. Data Collected from the different Standard Sources.

[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16]

**Data Cleaning-** in this stage, a consistent format for the data model was developed which took care of missing data, finding duplicated data, and weeding out of bad data. Finally the cleaned data were transformed into a structure format suitable for data mining. A very low-quality information is available in various data sources and on the web; many organizations are interested in how to transform the data into cleaned forms which can be used for high-profit purpose. This goal generates an urgent need for data analysis aimed at cleaning the raw data. [1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16]

**Data Selection:** at this stage, data relevant to the analysis was decided on and retrieved from the dataset.

[1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16]

**Data Transformation:** This is also known as data consolidation. It is the stage in which the selected data is transformed into forms appropriate for data mining. The data file was saved in Comma Separated Values (CSV) file format and the datasets were normalized to reduce the effect of scaling on the data [1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16]

**Data Mining Stage** – The data mining stage was divided into three types of phases. At each phase all the algorithms were used to analyze the [1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16] data sets. The testing method adopted for this research was percentage split that train on a percentage of the dataset, Cross validate on it and test on the remaining percentage.

**Comparison of Data Mining Techniques (Clustering and Classification techniques):** -



According to the earlier work done by researchers presented in the literature review, a comparison can be done. Different data mining techniques was used to predict different parameters of agriculture, Dairy Farming, Health issues, CKD issues. Various attributes used for the comparison are applications, authors, data mining techniques, algorithms, time period, accuracy percentage, advantages and disadvantages

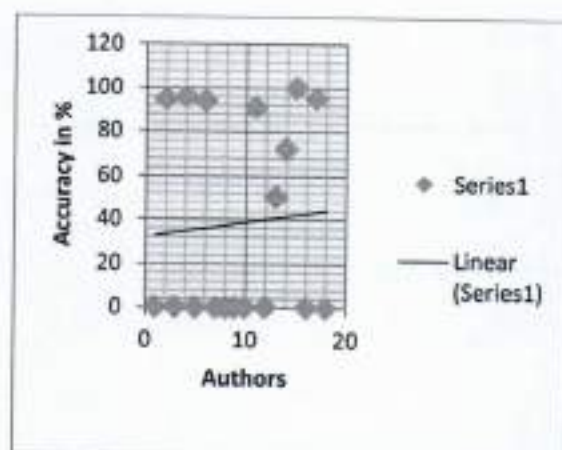


Fig: Comparison of DM techniques in accuracy with respective Authors.

X - Axis	Y - Axis
Authors/algorithms used	Accuracy in %
[1] J48	95
[2] Association Rule	NM
[3] Logistic Reg.	96
[5] J48	NM
[6] Apriori	94
[7] RPAI classification	NM
[8] data Compression algo	NM
[10] KDD	NM
[15] J48	NM
[22] Clustering algo	91
[23] Priority Ass Algo	NM
[24] Clustering	50
[25] Naïve bayes ANN	72
[25] Naïve bayes	100
[26] K-means	NM
[27] KNN	95
[28] J48	NM

NM = Not Mentioned

The above figure shows the accuracy of different data mining algorithms. Comparison of Authors and accuracy in % , some of the authors from [1][2][3][4][5][6][7][8][9][10][11][12][13][14][15][16] are mentioned their result accuracy while adopting different DM techniques / algorithms and some of the authors not mentioned their result accuracy in % , but they have good job in their respective research.

#### References:

- [1] Antonio Roberto formaggio, Matheus Alves Vieira, Camilo DalelesRanno., Object Based Image Analysis (OBIA) Anand Data Mining (DM) in Landsat Time Series for Mapping Soybean in Intensive Agricultural Regions , 978-1-4673-1159-5/12/\$31.00 2012 IEEE pg(2257-2260)2012
- [2] Manish Saggat, Ashish Kumar Agrawal, Abhimanyu LadOptimization of Association Rule Mining using Improved Genetic Algorithms, 0-7803-8566-7/04/\$20.00 IEEE pg (3725-3729),2004
- [3] CarolinFenlon, Luke O Grady, Laurence ShallooRegression techniques for modeling conception in seasonally calving dairy cows, 2016 IEEE 16<sup>th</sup> International Conference on Data Mining Workshops, 2375-9259/16 2016.174 pg (1191-1196),2016
- [4] Yaoguang Hu, ZhengjieGuo, Jingqian Wen, Jialin Han Research on knowledge mining for agricultural machinery maintenance based on association rules, 978-4799-8389-6/15/\$31.00 2015,IEEE . pg (885-890) 10<sup>th</sup> Conference on Industrial Electronics and Applications (ICIEA) , 2015
- [5] Niketa Gandhi, Leisa J. Armstrong Rice Crop Yield Forecasting of Tropical Wet and Dry Climatic Zone of India Using Data Mining Techniques, 2016 IEEE 16<sup>th</sup> International Conference on Advances in Computer Applications (ICACA) IEEE, 978-1-5090-3770-4/16 pg (357-363), 2016
- [6] SabriSerkanGulluogluSegmenting Customers With Data Mining Techniques, ISBN: 978-4799-6376-8/15/\$31.00 IEEE pg (154-159), 2015
- [7] Zahid Halim, Dr. Rauf Baig, ShariqBashirSonification: A Novel Approach towards Data Mining, IEEE-ICET—2006 2<sup>nd</sup> International Conference on Emerging Technologies 1-4244-0502-5/06/\$20.0 13-14, November 2006 pg (548-553), 2006
- [8] Kriti Bhargava, Stepan Ivanov, William Donnelly, ChamilKulatungaUsing Edge Analytics to Improve Data Collection in Precision Dairy Farming, 2016 IEEE 41<sup>st</sup> Conference on Local Computer Networks Workshops DOI 10.1109/LCNW.2016.9 pg(137-144), 2016
- [9] Niketa Gandhi, Leisa J ArmstrongA review of the application of data mining techniques for decision making in agriculture, 978-1-5090-5256-1/16/\$31.00 IEEE, 2<sup>nd</sup> International Conference on Contemporary Computing and Informatics (ic3i) 2016 pg(1-6), 2016



- [10] SanyamBharara, A. Sai Sabitha, Abhay Bansal A review on Knowledge extraction for Business operations using Data Mining, 978-1-5090-9/17/\$31.00 IEEE, 2017 7<sup>th</sup> International Conference on Cloud Computing, Data Science & Engineering –Confluence pg (512-518), 2017
- [11] R. Senthil Kumar, Dr. C. RameshA Study on Prediction of Rainfall Using Data Mining Technique, Department of Computer Science and Engineering Satyabama University Chennai pg(09), Research Scholar [22]
- [12] Wei Zhang, Shuping Li, Xue Wang, ChunyanXiaApplication of Data Mining in Agricultural Topic Tracking, 978-1-4577-1587-7/11/\$26.00 IEEE International Conference on Computer and Network Technology pg (38-41), 2011
- [13] AyodeleLasisi and Rozaidaghazali, FolaLasisi, TututHerawan, Mustafa Mat DerisKnowledge Extraction of Agricultural Data Using Artificial Immune System, 978-1-4673-7682-2/15/\$31.00 IEEE 2015 12<sup>th</sup> International conference on Fuzzy Systems and Knowledge Discovery pg (1653-1658), 2015
- [14] Hisayoshi Kato, Hironori, Hiraishi and Fumio MizoguchiLog summarizing agent for web access data using Data Mining techniques, 0-7803-3/01/\$10.0 IEEE 2015 12<sup>th</sup> International Conference on Fuzzy Systems and Knowledge Discovery (FSKD) pg (2642-2647), 2001
- [15] R. Sujatha, Dr. P. IsakkiDeviA Study on Crop Yield Forecasting Using Classification Techniques, 978-1-4673-8437-7/16/\$31.00 IEEE pg (4), 2016
- [16] Liquiong Tang, Phillip AbplanalpGPS Guided Farm Mapping and Waypoint Tracking Mobile Robotic System, 978-1-4799-4315 2014 IEEE 9<sup>th</sup> Conference on Industrial Electronics and Applications (ICIEA), pg (1676-1681), 2014
- [17] V. Vijay Hari Ram, H. Vishal Regulation of Water in Agriculture Field Using Internet of Things, 978-1-4799-7758-1/15/\$31.00 IEEE, International Conference on Technological Innovations in ICT for Agriculture and Rural Development (TIAR 2015), pg (112-115), 2015
- [18] Srisruthi.S, N. Swarna, G.M. SusmithaRos, Edna Elizabeth Sustainable Agriculture using Eco-friendly and Energy Efficient Sensor Technology, 978-1-5090-0774-5/16/\$31.00 IEEE International Conference on Recent Trends in Electronics Information Communication, Technology, 2013, India pg (1442-1446), 2016
- [19] Esther HochsztainA Mining approach to evaluate geoportals usability, 978-1-4673-8111-6/15 \$31.00 IEEE International Workshop on Data Mining with Industrial Applications pg (1-7), 2015
- [20] Lorenzo Di Silvestro, Michael Burch, Margherita Caccamo, Daniel Weiskopf, Fabian Beck, Giovanni GalloVisual Analysis of Time-dependent Multivariate Data from Dairy Farming Industry, 5<sup>th</sup> International Conference on Information Visualization theory and applications (IVAPP – Pages 99-106 2014 – International Conference on Information Visualization Theory and Applications – IVAPP- Italy, Germany pg (99-106), 2014, ISBN: 978-989-758-055-5
- [21] M.H. Ariff, I. Ismarani, N. ShamsuddinRFID Based Systematic Livestock Health Management System, 978-1-4700-6100 -1/14/\$31.00 IEEE Conference on Systems, Process and Control (ICSPC-2014) pg (6), 2014
- [22] Chen Jinyin, Lin Xiang, Zheng Haibing, BaoXintongA novel cluster center fast determination clustering algorithm, ELSEVIER, Applied Soft Computing 57 (2017) 539-555- Journal www.elsevier.com/locate/950c- 2017. Pg (539-555), 2017
- [23] S. DilliArasu, Dr. R. ThirumalaiselviA Novel imputation method for effective prediction of coronary kidney disease, 978-1-5090-6221-8/17/\$ 31.00 C -2017 IEEE 2<sup>nd</sup> International Conference on Computing and Communications Technologies (ICCT/17) pg (127-136), 2017
- [24] Zou Chuan, Tang Ying, Bai Li, Zeng Li, Zeng Yuqun, Lu Fuhua, Guangdong Provincial hospital of Traditional Chinese Medicine, Guangzhou, China Application of clustering analysis to explore syndrome evolution law of peritoneal dialysis patients
- [25] Veenita Kunwar, Khushboo Chandel, A. Sai Sabitha, abhay Bansal, ASET, CSE, amity University, Uttar Pradesh, Noida, India, 978-1-4673-8203-8/16/\$31.00C 2016 IEEE ' Chronic Kidney Disease analysis using data mining classification techniques.
- [26] Due Thanh Anh Luong, Dept of comput. Sci & Engi, uni, at Buffalo Buffalo, NY, USAA K-Means Approach to Clustering disease Progressions IEEE Keywords, Sep 2017,
- [27] Narander Kumar, Sabita KLhatri, Department of Computer, 3<sup>rd</sup> IEEE International Conference on Computational Intelligence and communication Technology (IEEE-CICT 2017) "Implementing WEKA for medical data classification and early disease prediction 978-1-5090-6218-8/17/@31.00 @2017 IEEE
- [28] AKIhelper: Acute kidney injury diagnostic tool using KDIGO guideline approach, Issariya uboltham, Nakornthip Prompon, wirichal Pan-ngum, department of Computer Engineering Chulalongkon University, bangkook, Thailand, 978-1-2090-0806-3/16/\$31.00 Copyright 2016 IEEE 2016 June 26-29, 2016 okayama Japan