Sequential minimal optimization classification approach for caesarian section classification dataset data set by applying various kernels

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Abstract: This research work presents a decision making of healthcare operational system by using machine learning classifiers algorithm to predict the decision making in comparison to the actual decision making. This model may help to doctor for making the best decisions. This model helps us to predict surgery. This study explains utilization of machine learning algorithms in determination of medical operation methods. The results show that SMO in Puk Kernel parameter for this case study generates highest accuracy level of 62.50%.

I. INTRODUCTION

Machine learning in today's healthcare is unavoidable. Optimists predict that machine learning and artificial intelligence will diagnose disease better and earlier, treat illness more precisely and engage patients more efficiently in future healthcare. Recent advancements in machine learning have demonstrated that machine learning can create algorithms that perform on par with human physicians.

Today's healthcare needs effective methods and research methodologies to save lives, reduce the cost of the healthcare services and early discoveries of contagious diseases. Machine learning techniques can enable healthcare organizations to predict trends in patient conditions and their behaviors. Recent findings in healthcare sector led to the collection of large size of rich data. McKinsey estimates that big data and machine learning could generate a value of $100 billion annually based on better decision making, optimized innovation and improved efficiency of clinical trials. Extracting useful knowledge and regularities from datasets can provide a major opportunity for practical use to improve healthcare. Knowledge acquired in this manner can be used to predict trends of patient's condition in shortest possible time and reduce the cost of healthcare services.

In recent years instances in healthcare such as medical image processing and analyzing, predicting healthcare operational decisions, dosage trials for intravenous tumor treatment detection and management of prostate cancer.

In this paper organizes section one has related works and brief introduction of this fields, section two presents Materials and Methods, the section three describes results and discussions and the section four presents conclusion.

II. MATERIALS AND METHODS

In this section presents the materials and methods of this research work. Here the dataset borrowed from Caesarian Section Classification Dataset Data Set (https://archive.ics.uci.edu/ml/datasets/Caesarian+Section+Classification+Dataset#). In this dataset contains information about caesarian section results of 80 pregnant women with the most important characteristics of delivery problems in the medical field. The below table describes the attributes detail in this dataset.

Table 1 Attribute Description in the dataset

S.No	Name of the Attribute	Values of the Attribute	Characteristics of Attribute	Meaning of the Attribute
1	Age	22,26,28,27,32,36,33,23 ,20,29,25,37,24,18,30,4 0,31,19,21,35,17,38	Numeric	Pregnant ladies age between 22 to 38
2	'Delivery Number	1,2,3,4	Numeric	Delivery Number 1 to 4
3	'Delivery time	0,1,2	Numeric	0 = timely , 1 = premature , 2 = latecomer
4	'Blood of Pressure'	2,1,0	Numeric	0 = low , 1 = normal , 2 = high
5	'Heart Problem'	1,0	Numeric	0 = apt, 1 = inept
6	Caesarian	0,1	Numeric	0 = No, 1 = Yes

In this research work applied in weka 3.8.3 version for SMO classification method by applying various kernels namely Polykernel, Normalized Polykernel, Puk, and RBF Kernel were applied to calculate for predicting caesarian section operational decisions. In this research work considers one of the attribute namely Caesarian it has ‘0’ represents ‘No’ and ‘1’ represents ‘Yes’ in class.

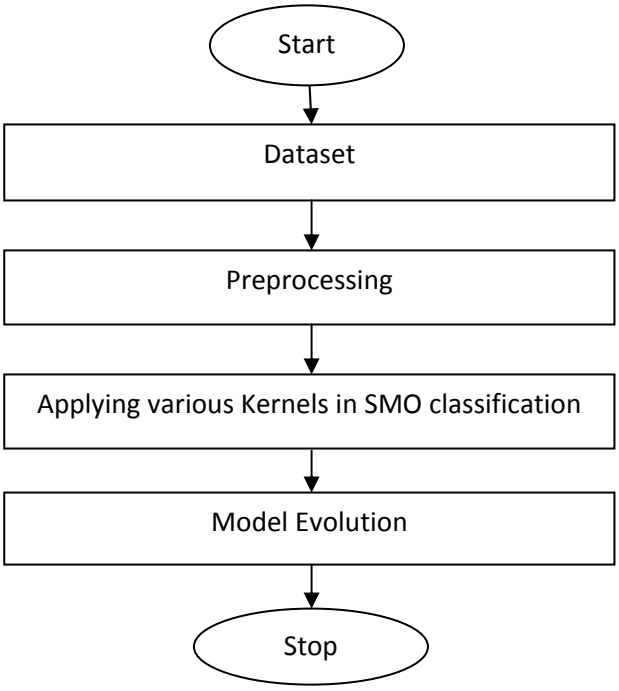

Figure 1 Architecture of Proposed method

III. RESULTS AND DISCUSSIONS

Machine learning has great importance for area of healthcare, and it represents comprehensive process that demands thorough understanding of needs of the healthcare organization regarding operational decisionmaking.

Table 2 Accuracy level of SMO Classification by using different kernels

S.No	Kernels in SMO	Accuracy level
1	Polykernel	58.75 %
2	Normalized Polykernel	61.25%
3	Puk	62.50%
4	RBF Kernel	57.5%

In this study, the machine learning techniques was used for selecting the most significant features to be used in predicting caesarian section accurately. In this SMO machine learning algorithm by applying various kernels namely Polykernel, Normalized Polykernel, Puk, and RBF Kernel were applied to calculate for predicting caesarian section operational decisions.

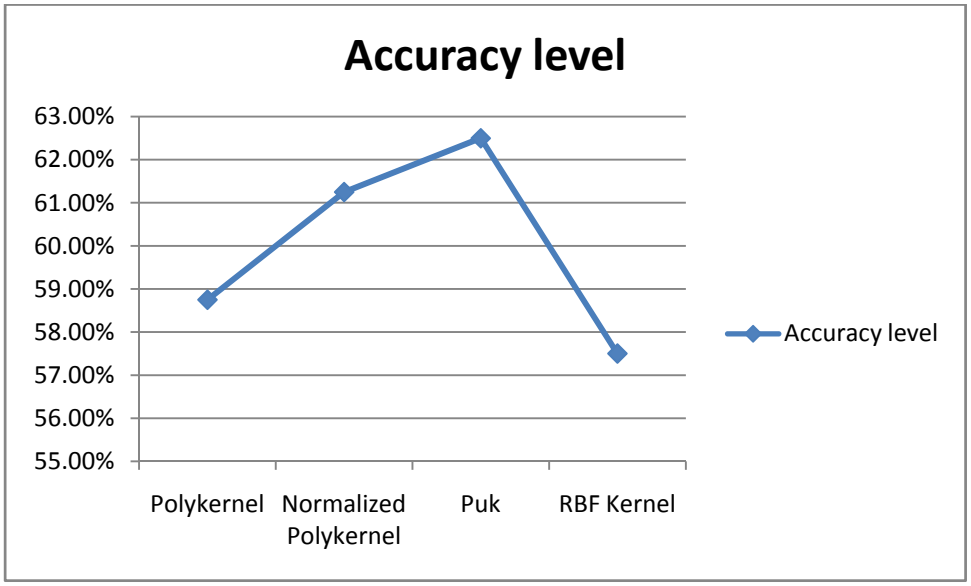

Figure 2 Accuracy level of SMO Classification by using different kernels

In this SMO machine learning algorithm by applying various kernels namely Polykernel, Normalized Polykernel, Puk, and RBF Kernel. According to our work, TP Rates are 0.588, 0.163, 0.625, and 0.575 respectively Polykernel, Normalized Polykernel, Puk, and RBF Kernel. In FP Rates are 0.382,0.425,0.400 and 0.575respectively Polykernel, Normalized Polykernel, Puk, and RBF Kernel. Precisions are 0.618, 0.607, 0.622 and Nil respectively Polykernel, Normalized Polykernel, Puk, and RBF Kernel. Recalls are 0.588, 0.607, 0.625, 0.575respectively Polykernel, Normalized Polykernel, Puk, and RBF Kernel. F- Measures are 0.5870.6070.623 and Nil respectively Polykernel, Normalized Polykernel, Puk, and RBF Kernel. MCC's are 0.207,0.193,0.227 and Nil.ROC areas are 0.6030.5940.6130.500respectively Polykernel, Normalized Polykernel, Puk, and RBF Kernel.PRC Areas are 0.572,0.566,0.579 and 0.511respectively Polykernel, Normalized Polykernel, Puk, and RBF Kernel.

Table 3 Different Measures of SMO Classification by using different kernels

Kernels in SMO	TP Rate	FP Rate	Precision	Recall	F-Measure	MCC	ROC Area	PRC Area
Polykernel	0.588	0.382	0.618	0.588	0.587	0.207	0.603	0.572
Normalized Polykernel	0.613	0.425	0.607	0.613	0.607	0.193	0.594	0.566
Puk	0.625	0.400	0.622	0.625	0.623	0.227	0.613	0.579
RBF Kernel	0.575	0.575	Nil	0.575	Nil	Nil	0.500	0.511

IV. CONCLUSION

The experiment results show that SMO with Puk kernel achieved the best accuracy rates by predicting 62 cases correctly compare than other models. So,this research work recommended for decision making based on the SMO with Puk kernel classification.

V. REFERENCES

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