

Prediction of Web Page by Hybrid Markov Model

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INTRODUCTION:

Prediction of user behavior on world wide web is gaining importance now a days .Generally Markov models are used for the purpose of prediction. Different order Markov models are used for prediction. These models are first order markov model, second order markov model,kth order markov model ,hidden markov model, selective markov model etc.In this research work implemented a hybrid markov model which is a combination of hidden markov model and k nearest neighbour algorithm. The performance is evaluated on comparing with selective markov model.

RESEARCH GOAL:

The Hybrid Markov model is implemented in order to enhance the accuracy of prediction. The analysis of model is done by taking four parameters into consideration. These parameters are accuracy, error rate, memory uses, search time. Here ,accuracy denotes the accuracy of prediction which is calculated as

$$Accuracy = \frac{Total\ correctly\ identified\ patterns}{Total\ patterns\ available} * 100(1)$$

Error rate of the system is inversely proportional to the accuracy obtained

$$Error\ rate = 100 - Accuracy \quad (2)$$

The amount of memory required to successfully execute the algorithms is known as memory uses. The time required to predict user's next web page request is known as model search time.

RESEARCH WORK

The implemented hybrid markov model reads the URL opened in the browser and also keeps track of the sequence of URL opened. The number of URL's opened once the browser is opened until is closed is stored in the form of session .Therefore a number of sessions are formed along with date of forming of session.

Session ID	SessionID	Site	TimeSpent	REOpened	Date1
1					
2	1	http://www.mad...	0.4	2	13-11-2013
3	3	http://www.gdhe...	0.3	2	13-11-2013
4					
5					
6					
7					
8	3	http://facebook...	1.9	2	13-11-2013
9					

Fig 1

As shown in the screenshot different sessions are formed which are stored by the name session ID .One session determines the number of URL's opened also gives the date

of session formation. One can also view the sessions from specified date. After classification in session the hidden and selective markov models are used for predicting the next URL opened from the selected URL.

SYSTEM ARCHITECTURES

Fig 2 and Fig 3 depicts the full system, In fig2 web server access logs are formed from the world wide web and from the web server the data are retrieved. Fig 3 shows the architecture of the full system from the browser navigation session wise logs are formed from these logs transaction matrix is created sessions are further classified by using k nearest neighbor algorithm and the Bayesian classifier

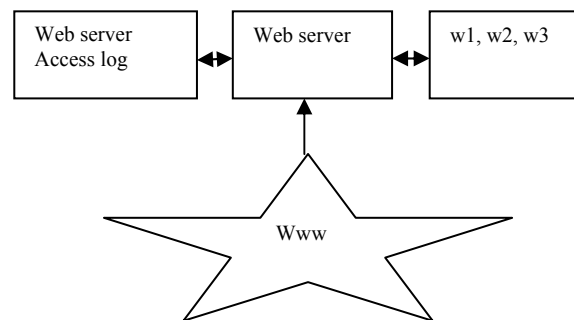


Fig 2

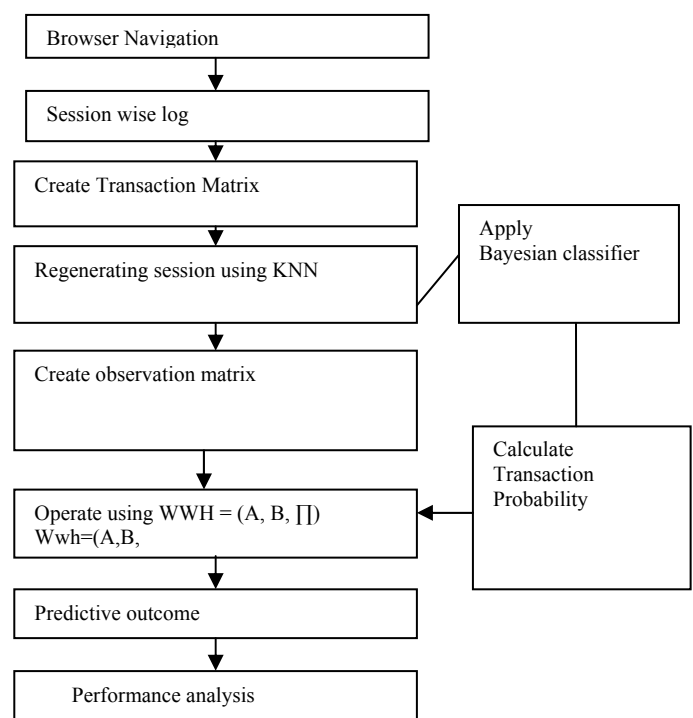


Fig 3

RESULT

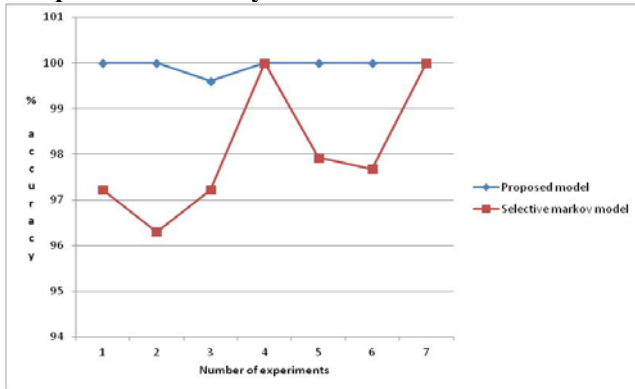
Accuracy in %

Dataset Size	Proposed Model	Selective Markov Model
1	100	97.22
2	100	96.30
3	99.60	97.22
4	100	100
5	100	97.92
6	100	97.68
7	100	100

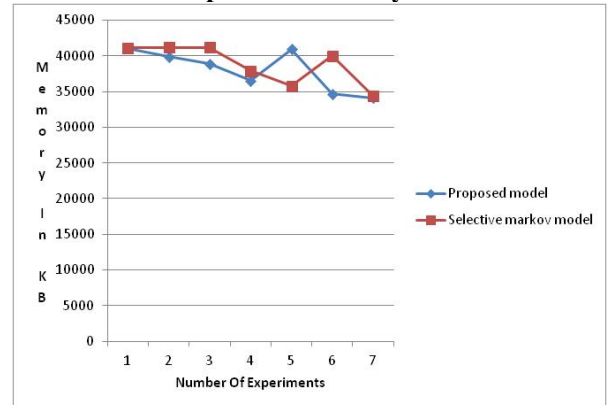
Memory Uses in KB

Data Set Size	Proposed Model	Selective Markov Model
1	41064	4110
2	39908	41160
3	38876	41200
4	36556	37884
5	40936	35776
6	34676	39988
7	34140	34360

Comparative Accuracy



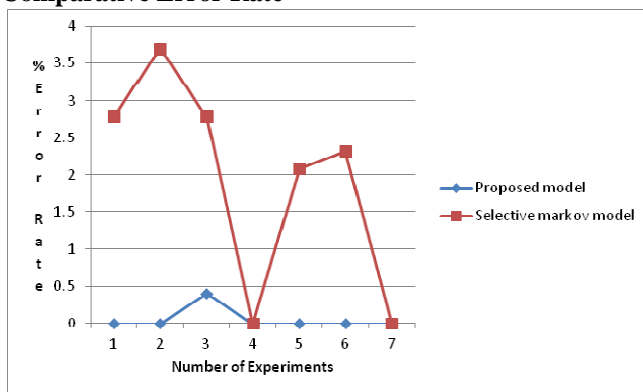
Comparative Memory Uses



Error Rate in %

Dataset Size	Proposed Model	Selective Markov Model
1	0	2.78
2	0	3.7
3	0.4	2.78
4	0	0
5	0	2.08
6	0	2.32
7	0	0

Comparative Error Rate



CONCLUSION AND FUTURE WORK

From the above results it is concluded that the proposed hybrid markov mode shows increase in accuracy by 5% - 9%, error rate is reduced in proposed model and also the proposed model consumes less memory as compared to traditional model.

In future it is possible to use more generalized algorithm and one can also use other classification technique other than K nearest neighbor .

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