The most important moral issue in the credit card trade is fraud involvement. The main aspires are, primarily, to recognize the different types of credit card fraud, and secondly, to evaluate unconventional techniques that have been used in fraud detection. The sub-aim is to present, compare and examine recently published discovering in credit card fraud detection. Credit card fraud detection has developed a number of techniques via bunch of investigate interest and, with special importance on, data mining and distributed data mining have been recommended. Also there is a problem is, first the observation data possibly will be missing for a number of intervals. Following that there are multiple observation streams that are not necessarily synchronous to each other and possibly will have different “emission distributions” for the same state. So in proposed research we are using multiple observation sequences which are associated with the semi hidden state sequence and these observations may not be synchronized to each other. We divide a large data set of labeled transactions (either fraudulent or legitimate) into smaller subsets by applying distributed data mining techniques to generate classifiers in parallel, and come together the resultant base models by metalearning from the classifiers’ performance to produce a metaclassifier in addition extensibility, combining multiple models computed over all available data produces metaclassifiers that can counterbalance the loss of predictive presentation that usually occurs when mining from data subsets or sampling. Furthermore, when we use the learned classifiers (for example, during transaction authorization), the base classifiers can carry out in parallel, with the metaclassifier then combining their results. So, our approach is highly efficient in generating these models and also relatively efficient in applying them.

Nowadays the customers prefer the most accepted payment mode via credit card for the convenient way of online shopping, paying bills in easiest way. At the same time
the fraud transaction risks using credit card is a main problem which should be avoided. There are many data mining techniques available to avoid these risks effectively. In existing research they modeled the sequence of operations in credit card transaction processing using a Hidden Markov Model (HMM) and shown how it can be used for the detection of frauds. To provide better accuracy and to avoid computational complexity in fraud detection in proposed work semi Hidden Markov model (SHMM) algorithm of anomaly detection is presented which computes the distance between the processes monitored by credit card detection system and the perfect normal processes. With this we are implementing another method for fraud detection is that having a key idea is to factorize marginal log-likelihood using a variation distribution over latent variables. An asymptotic approximation, a factorized information criterion (FIC) obtained by applying the Laplace method to each of the factorized components. This method is also having a larger class of practical problems that can be properly modeled in the setting of SHMM. Also major constraint is found, conversely, in mutually HMM and SHMM, i.e., it is generally imagined that there survives at least one observation connected with every state that the hidden Markov chain takes on.

To improve the efficiency of SHMM in our proposed research we are combining the multiple observation of SHMM called Multiple Semi Hidden Markov Model (MSHMM) through this we can improve the detection accuracy better than the SHMM. In normal Hidden Markov Model the problem of cannot find an optimal state sequence for the underlying Markov process also this observed sequence cannot be viewed as training a model to best fit the observed data. In this research, the main aim is to model the sequence of observations in credit card transaction processing using an Advanced Hidden Markov Model (AHMM) and show how it can be utilized for the exposure of frauds. In this process an AHMM is initially trained with the regular manners of a
cardholder. If an incoming credit card transaction is not recognized by the trained AHMM with adequately high probability, it is believed to be fraudulent. This proposed work desire to regulate the model parameters to best fit the observations. The ranges of the matrices \((N, M)\) are fixed but the elements of \(A, B, \text{and} \pi\) are to be decided, focus to the rank stochastic condition. The information that can efficiently re-estimate the model itself is one of the more incredible features of HMMs this referred here as AHMM. The experimental results shows that we can significantly reduce loss due to fraud through distributed data mining of fraud models through this proposed work of AHMM.

The major drawbacks in these methods are to compute the model parameters significantly which impacts the performance of the detection accuracy. So, a novel technique is introduced named as Optimized Multiple Semi-Hidden Markov Model (OMSHMM) for optimizing the model parameters. For finding optimal values, the Cuckoo Search algorithm is proposed. By using this algorithm, the number of states, and probability distributions of states are decided. The Optimized Multiple Semi-Hidden Markov Model shows higher rate when compared to the existing Multiple Semi-Hidden Markov Model. OMSHMM method the optimal values of number of states and model parameters of the Multiple Semi-Hidden Markov Model are determined. If the number of data sets is 50, the precision rate in OMSHMM is 0.91 and the recall in OMSHMM is 0.81. Based on the comparison and the results from the experiment shows the proposed approach works better than the other existing systems with higher rates.