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## Performance Evaluation of Machine Learning Techniques for Customer Churn Prediction in Telecommunication Sector

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Abstract

The principle objective of this chapter is to build up a churn prediction model which helps telecom administrators to foresee clients who are no doubt liable to agitate. Many studies affirmed that AI innovation is profoundly effective to anticipate this circumstance as it is applied through training from past information. The prediction procedure is involved three primary stages: normalization of the data, then feature selection based on information gain, and finally, classification utilizing different AI methods, for example, back propagation neural network (BPNM), naive Bayesian, k-nearest neighborhood (KNN), support vector machine (SVM), discriminant analysis (DA), decision tree (DT), and extreme learning machine (ELM). It is shown from simulation study that out of these seven methods SVM with polynomial based kernel is coming about 91.33% of precision where ELM is at the primary situation with 92.10% of exactness and MLANN-based CCP model is at third rank with 90.4% of accuracy. Similar observation is noted for 10-fold cross validation also.

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### Chapter Preview

### Introduction

Modeling of customer churn prediction(CCP) has been used in various sectors like different products, commodities, finance, social network, telecommunication, airlines, online gaming and banking(Athanassopoulos, 2000). The CCP models are developed to find out those customers whose probability or chances of churning or leaving the organization is high. It helps the organizations to focus seriously on those customers with some retention strategy. Hence it helps the enterprise to use efficiently its limited marketing budgets. Retention of consumers is highly profitable to companies because of three reasons: (1) finding out new customers is more costly than retaining existing customers(Athanassopoulos, 2000), (2) old customers are more loyal, do not attracted by other marketing competitors, require less budget to serve, and in the other hand they generate revenue for the organization through viral marketing (Farquard et al., 2014), and (3) churn of customers means loss to organization due to reduction in sales(Ganesh et al., 2000). Therefore, most of the companies are now interested in retention of old customers than attracting new customers (Amin et al., 2016). However, identification of active chumers out of a large samples of customer base is a hectic job. For this reason, enterprises are now a days using predictive churn models to make their position in the competitive market.

Complete Chapter List

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Editorial Advisory Board	<a href="#">View Full PDF</a>
Table of Contents	<a href="#">View Full PDF</a>
Detailed Table of Contents	<a href="#">View Full PDF</a>
Foreword	<a href="#">View Full PDF</a>
Ajith Abraham	
Preface	<a href="#">View Full PDF</a>
Mrutyunjaya Panda, Harekrishna Misra	
Acknowledgment	<a href="#">View Full PDF</a>
Mrutyunjaya Panda, Harekrishna Misra	