Chapter 14
Review on Various Machine Learning and Deep Learning Techniques for Prediction and Classification of Quotidian Datasets

Anisha M. Lal
Vellore Institute of Technology, India

B. Koushik Reddy
Vellore Institute of Technology, India

Aju D.
Vellore Institute of Technology, India

ABSTRACT

Machine learning can be defined as the ability of a computer to learn and solve a problem without being explicitly coded. The efficiency of the program increases with experience through the task specified. In traditional programming, the program and the input are specified to get the output, but in the case of machine learning, the targets and predictors are provided to the algorithm make the process trained. This chapter focuses on various machine learning techniques and their performance with commonly used datasets. A supervised learning algorithm consists of a target variable that is to be predicted from a given set of predictors. Using these established targets is a function that plots targets to a given set of predictors. The training process allows the system to train the unknown data and continues until the model achieves a desired level of accuracy on the training data. The supervised methods can be usually categorized as classification and regression. This chapter discourses some of the popular supervised machine learning algorithms and their performances using quotidian datasets. This chapter also discusses some of the non-linear regression techniques and some insights on deep learning with respect to object recognition.

INTRODUCTION

Machine learning can be defined as the ability of a computer to learn and solve a problem without being explicitly coded. The efficiency of the program increases with experience through the task specified. In traditional programming the program and the input are specified to get the output, but in the case of machine learning the targets and predictors are provided to the algorithm which makes the process trained. This chapter focuses on various machine learning techniques and its performance with quotidian datasets. A supervised learning algorithm consists of a target variable which is to be predicted from a given set of predictors. Using these established targets, a function that plots targets to the given set of predictors. The training process allows the system to train the unknown data and continues until the model achieves a desired level of accuracy on the training data. The supervised methods can be usually categorized as classification and regression. In classification, the data is classified into the groups based on the prior data that is used to train the machine learning model. In regression, the model is trained with the target data to make the predictions of the unknown predictors, when the parameters whose output is unknown is passed to the algorithm, it predicts based on the target that is used to train the data. This chapter discourses some of the popular supervised machine learning algorithms and their performances using quotidian datasets. This chapter also discusses some of the non-linear regression techniques and some insights on deep learning with respect to object recognition.

APPLICATIONS

Machine Learning concepts are used in various domains, such as in the field of medicine where these techniques can be used for the detection, diagnosis of the diseases in the patients with the minimal effort. In the field of sports, predictions are made for the combination of the players for which the probability of the team winning or losing is predicted, in stock market the predictions of the share value of being increased or decreased in the coming certain period of days if so what is the percentage of change and all sort of factors can be predicted. Earth is the largest reserve of natural mines such as gold, silver etc., these locations can be predicted accurately such that the mining can be performed without much effort in locating the resources. The websites are automatically customized based on the user taste. Artificial Limbs can be attached to the people. In the field of bio informatics, the gene classifications get way lot easier. The computer vision has played a great role in the field of security and Artificial Intelligence. So, the applications extend from spam filtering all the way to complex Artificial bots that are still being prototyped.

Important Terms

Cost Function

It is the function used to calculate the penalty based on the difference between the predicted output and the actual output. The more the cost the less is the accuracy of the algorithm and the less the cost the better the accuracy of the algorithm that is being applied.

Related Content

AI and Crime Prevention With Image and Video Analytics Using IoT

Shalini Ninoria, Ramakant Upadhyay, Reena Susan Philip, Richa Dwivedi, Gabriela Micheal, Ankur Guptaand Sudha Mishra (2023). *Handbook of Research on Thrust Technologies' Effect on Image Processing (pp. 96-115).*

www.irma-international.org/chapter/ai-and-crime-prevention-with-image-and-video-analytics-using-iot/328028

Modeling Visual Saliency in Images and Videos

Yiqun Hu, Viswanath Gopalakrishnanand Deepu Rajan (2013). *Image Processing: Concepts, Methodologies, Tools, and Applications (pp. 79-100).*

www.irma-international.org/chapter/modeling-visual-saliency-images-videos/77539

Optimal Image Watermarking using Hybrid Optimization Algorithm

Satish Ramchandra Todmaland Suhas Haribhau Patil (2015). *International Journal of Computer Vision and Image Processing (pp. 27-47).*

www.irma-international.org/article/optimal-image-watermarking-using-hybrid-optimization-algorithm/151506

Real-Time Classification of Water Spray and Leaks for Robotic Firefighting

Joshua G. McNeiland Brian Y. Lattimer (2015). *International Journal of Computer Vision and Image Processing (pp. 1-26).*

www.irma-international.org/article/real-time-classification-of-water-spray-and-leaks-for-robotic-firefighting/151505

Video Semantic Analysis: The Sparsity Based Locality-Sensitive Discriminative Dictionary Learning Factor

Daniel Danso Essel, Ben-Bright Benuwaand Benjamin Ghansah (2021). *International Journal of Computer Vision and Image Processing (pp. 1-21).*

www.irma-international.org/article/video-semantic-analysis/275815