

Chapter 9

Machine Learning Algorithms

Namrata Dhanda
Amity University, India

Stuti Shukla Datta
Amity University, India

Mudrika Dhanda
Royal Holloway University, UK

ABSTRACT

Human intelligence is deeply involved in creating efficient and faster systems that can work independently. Creation of such smart systems requires efficient training algorithms. Thus, the aim of this chapter is to introduce the readers with the concept of machine learning and the commonly employed learning algorithm for developing efficient and intelligent systems. The chapter gives a clear distinction between supervised and unsupervised learning methods. Each algorithm is explained with the help of suitable example to give an insight to the learning process.

INTRODUCTION

Can a person with both his legs amputated still drive a car, or a man with impaired vision can cross a busy road without assistance. The answer to these questions, which once seemed impossible, is in affirmative now. This has become possible due to machine learning. So what is machine learning then? It is a field of science which provides systems the ability to learn and adapt from the environment conditions. Here, the objective is to develop programmed models that can access data and further use them for improving their performance without much human intervention. So

DOI: 10.4018/978-1-5225-7955-7.ch009

straight away next question that comes into one's mind how these systems acquire intelligence? So the intelligence is acquired through learning. Learning is a very crucial component in developing an intelligent system. Learning may be supervised or unsupervised. Supervised learning refers to inferring a mapping function between input and output using a set of training data. Later the function can be employed for assessing testing data. Unsupervised learning refers to developing hidden structure in the input data. These learning models can be employed in developing a classifier or a predictor. As an example let us consider a person with impaired vision and he is wearing intelligent goggles while moving on the roads. The intelligent gadget in the form of goggles is continuously monitoring the scenario on the road. Now if the person has to cross the road these goggles would take the input in the form of image and classify whether the road in front of the person is busy or not and would help him in making the decision of whether to cross the road or not. It is often observed that if one has browsed for the flight cost from Delhi to Mumbai two three times on the home page of an air services, and the next time when he logs on to the site, he gets a display of prices offered by various air service provider along with their routes for round trip between Delhi and Mumbai. This is an example of adaptive learning or more specifically, learning from the query. Thus objective is to create intelligent systems that could assist human in the areas where human intelligence has limitation. Lot of researches and investigations are going across the globe to evolve new and better learning methods.

Machine learning is a field of Computer Science which often uses statistical techniques to give computers the ability to learn. It is closely related to artificial intelligence which is enabling computers to perform human-like activities. Machine learning is giving computers the ability to learn without being explicitly getting programmed. Thus, this chapter introduces the reader with commonly employed supervised and unsupervised learning algorithms.

The chapter is organized mainly in four sections: first section deals with the introduction to Machine Learning and how intelligent systems can work for the betterment of life. Second section deals with parametric and nonparametric algorithms. Third section discusses in details the commonly employed supervised learning algorithm with example to assist readers gain an insight towards learning techniques. Fourth section deals with unsupervised learning algorithms example clustering and a priori methods.

22 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/machine-learning-algorithms/224450

Related Content

Modeling Defects in E-Projects

John D. Ferguson and James Miller (2009). *Integrated Approaches in Information Technology and Web Engineering: Advancing Organizational Knowledge Sharing* (pp. 317-330).

www.irma-international.org/chapter/modeling-defects-projects/24001

Caching on the Web

Mehregan Mahdavi and Boualem Bentallah (2007). *Web Data Management Practices: Emerging Techniques and Technologies* (pp. 124-158).

www.irma-international.org/chapter/caching-web/31099

E-Portfolio to Promote the Virtual Learning Group Communities on the Grid

Emilie Conté and Guy Gouardères (2009). *Agent Technologies and Web Engineering: Applications and Systems* (pp. 117-133).

www.irma-international.org/chapter/portfolio-promote-virtual-learning-group/5030

Development of a Novel Compressed Index-Query Web Search Engine Model

Hussein Al-Bahadili and Saif Al-Saab (2011). *International Journal of Information Technology and Web Engineering* (pp. 39-56).

www.irma-international.org/article/development-novel-compressed-index-query/64174

An Agent-Mediated Platform for Business Processes

Hoa Khanh Dam, Aditya Ghose and Mohammad Qasim (2015). *International Journal of Information Technology and Web Engineering* (pp. 43-61).

www.irma-international.org/article/an-agent-mediated-platform-for-business-processes/138294