Chapter 10
Machine Learning Algorithms Used for Iris Flower Classification

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ABSTRACT

Classification is a supervised machine learning technique which is used to predict group membership for data instances. For simplification of classification, one may use scikit-learn tool kit. This chapter mainly focuses on the classification of Iris dataset using scikit-learn. It concerns the recognition of Iris flower species (setosa, versicolor, and verginica) on the basis of the measurements of length and width of sepal and petal of the flower. One can generate classification models by using various machine learning algorithms through training the iris flower dataset, and can choose the model with highest accuracy to predict the species of iris flower more precisely. Classification of Iris dataset would be detecting patterns from examining sepal and petal size of the Iris flower and how the prediction was made from analyzing the pattern to form the class of Iris flower. By using this pattern and classification, in future upcoming years the unseen data can be predicted more precisely. The goal here is to gain insights to model the probabilities of class membership, conditioned on the flower features. The proposed chapter mainly focuses on how one can train their model with data using machine learning algorithms to predict the species of Iris flower by input of the unseen data using what it has learnt from the trained data.

1. INTRODUCTION

Machine learning is a process of feeding a machine enough data to train and predict a possible outcome using the algorithms. The more the processed or useful data is fed to the machine the more efficient the machine will become. It has tools and technology that we can utilize to answer questions with our data. Machine Learning can work on two values viz., discrete and continuous. The use and applications of Machine Learning has wide area like Weather forecast, Image Recognition, Spam detection, Traffic Prediction, Speech Recognition, Automatic Language Translation, Biometric attendance, Product Recommendations, Computer vision, Stock Market Trading, Medical Diagnosis and many more (Shukla A., Pant H., Agarwal A. & Mishra P., 2020).

The learning methods of Machine Learning are of three types viz., supervised, unsupervised and reinforcement learning. Supervised learning contains instances of a training data set which is composed of different input attributes and an expected output. Classification which is the sub part of supervised learning where the computer program learns from the input given to it and uses this learning to classify new observation. There are various types of classification techniques; these are Decision Trees, Bayes Classifier, Nearest Neighbor, Support Vector Machine, Neural Networks and many more (Shukla A., Pant H., Agarwal A. & Mishra P., 2020).

The iris flower classification problem provides a hands-on introduction to machine learning, enabling practitioners to grasp essential concepts, data preprocessing, model training, evaluation, and deployment. It's a stepping stone toward more complex classification tasks and a foundation for understanding various machine learning algorithms. Iris flower classification using machine learning serves as an educational tool for understanding fundamental concepts in machine learning and classification. It has real-world applications in botany, agriculture, and environmental sciences for automating the classification of iris species based on their features. Furthermore, the iris flower classification problem serves as a benchmark for testing and comparing the performance of different machine learning models, fostering a deeper comprehension of algorithmic strengths and weaknesses. Its simplicity makes it an ideal starting point for beginners while providing a robust foundation for more advanced studies. The knowledge gained from this exercise goes beyond iris classification, providing transferable skills that can be applied to many fields. As machine learning continues to evolve, iris datasets remain a timeless resource for understanding and understanding the interactions between data and algorithms in distributed operations (Suchitra G., 2023).

This research work mainly focuses on the exploratory data analysis and classification of Iris Flower dataset using supervised machine learning. The problem concerns with getting insights and discovering the underlying structure of the dataset

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