Classification of Orchid Flowers Using SVM and Decision Trees in a Machine-Learning Model

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***Abstract*—This undergraduate thesis examines flower classification with support vector machines and decision trees. Although its Vietnamese title calls the task orchid classification, the implementation section uses the Iris dataset, with setosa, virginica, and versicolor examples. The source describes 150 labelled samples with sepal and petal measurements, divided into training and test data. It presents support vector machine, decision-tree, and k-nearest-neighbour implementations. In its comparison, the author reports 97.78% accuracy for the decision tree and describes the k-nearest-neighbour result as moderate. The written discussion does not state every comparison metric, so the summary confines numerical claims to values explicitly reported in the source.**

***Index Terms*—Support Vector Machine, Decision Tree, Iris flower, Classification, Machine Learning**

I. Introduction

Classifying flowers from measurements provides an example for comparing supervised learning methods. The thesis introduces support vector machines and decision trees as its named approaches and also considers k-nearest neighbours in the applied comparison. Its title uses the Vietnamese term for orchids, while the dataset described in the implementation is the standard Iris flower dataset. This summary retains the translated source title and identifies the dataset used in the experiments so that the research object is clear [1]. Earlier ICTU student work on related designs is included here for context [2]. Related published studies provide context for the subject and methods [3], [4], [5], [6], [7], [8], [9], [10]. These contextual works were selected for this English summary; they are not asserted to appear in the original thesis bibliography.

II. Methods

The source describes 150 Iris records labelled as setosa, virginica, or versicolor. Each record contains sepal length, sepal width, petal length, and petal width, and the author separates the records into training and test sets. The thesis implements a decision-tree classifier, a support vector machine, and a k-nearest-neighbour model. It uses predictions and accuracy calculations to compare their behaviour on the flower-classification task. The document includes code and a graphical comparison, although its accompanying prose does not enumerate every numerical value [1].

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III. Results

The report states that the decision tree reached 97.78% accuracy. It says this was lower than some other compared algorithms while describing another reported score as the highest, without supplying all of the score definitions in extractable text. The author characterizes the k-nearest-neighbour result as moderate and also includes a support vector machine in the comparison. These observations are limited to the source's Iris dataset experiment; no outcome for actual orchid species is documented [1].

IV. Discussion

The title and experimental subject require careful distinction: the Vietnamese cover refers to orchids, but setosa, virginica, and versicolor in the body are Iris flowers. The decision-tree accuracy is explicitly stated in the report, while the accompanying prose does not fully specify the other numerical results. The source's reference to negative and positive predictions is also imprecise for this three-class dataset. A more complete evaluation would need the original comparison table and clear definitions of the reported scores [1].

V. Conclusion

The thesis implements and compares supervised classifiers on the Iris flower dataset. It documents a 97.78% decision-tree accuracy and a qualitative comparison with support vector machines and k-nearest neighbours. Because the source title calls the task orchid classification, the summary distinguishes that wording from the actual Iris records described in the implementation. The written results support the stated decision-tree figure without establishing specific scores for every other model. The work remains a source-specific demonstration of machine-learning classification [1].

References

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