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Mushroom Classification

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Abstract: *Mushroom classification is an important task for distinguishing between edible and poisonous species, which has critical implications for public health, food safety, and ecology. In this study, we present a machine learning-based approach to classify mushrooms based on non-image data, utilizing a dataset with various physical and chemical characteristics of mushrooms, such as cap shape, color, gill size, and odor. Unlike image- based classification methods, our approach leverages structured tabular data to predict whether a mushroom is edible or poisonous. We experimented with several machine learning algorithms, including Decision Trees, Random Forests, Support Vector Machines (SVM), and k-Nearest Neighbors (k-NN), comparing their performance in terms of accuracy, precision, and recall. Feature engineering and selection were employed to identify the most predictive attributes, and hyperparameter tuning was performed to optimize model performance. Cross-validation was used to ensure robustness and generalization of the results. The findings demonstrate that tabular data can be a reliable source for mushroom classification, with models achieving high accuracy without the need for image data. The Random Forest classifier, in particular, yielded the best results, highlighting the effectiveness of ensemble methods in handling categorical and structured data. This study underscores the potential of using non-image data for accurate and efficient mushroom classification, providing an accessible solution for applications where image data may not be available or practical.*

Keywords: Machine Learning , NON - Image Data, Decision Tree, Random Forest, Support Vector Machine, K Nearest Neighbours, Feature Selection

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