Model for Predicting Image Recognition Using NCDR Teachable Machine

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***Abstract*— Image recognition has become a crucial part of modern AI applications due to its impact on industries including healthcare, retail, and security. In this project, Google's NCDR Teachable Machine is used to create a prediction model for picture recognition. The article outlines the fundamental concepts of the Teachable Machine, explains how to construct an image recognition model, and evaluates its performance in prediction tasks. We show experimental results on a generated dataset and analyze the model's accuracy, usefulness, and potential for real-world applications.**

***Index Terms*— Image recognition, Teachable Machine, prediction model, machine learning, AI applications.**

I. INTRODUCTION

Image recognition, which enables computers to understand and assess visual information, is a crucial component of artificial intelligence (AI). It used to take a lot of coding, processing power, and machine learning framework expertise to create such models. However, Google's NCDR Teachable Machine simplifies this process and makes it possible for non-experts to create machine learning models with its user-friendly interface. Examining the creation of an effective image recognition prediction model with NCDR Teachable Machine is the aim of this project. Using transfer learning and its pre-trained neural network capabilities, we analyze how effectively it recognizes and predicts image classes.

II. OVERVIEW

Teachable Machine is an internet tool that democratizes artificial intelligence by enabling anyone to train models without understanding any code. It can identify poses, noises, and sights. Because its image recognition module uses transfer learning on pre-trained convolutional neural networks (CNNs), such as MobileNet, it performs well for practical applications.

The key features of Teachable Machine are as follows:

A no-code interface facilitates model building.

Custom datasets allow you to upload labelled data.

Exportability: Models can be used as TensorFlow.js or Tensor Flow Lite for web and mobile applications.

III. METHODOLOGIES

3.1. Getting the Dataset Ready

The custom dataset includes two object categories: HDFC Bank and ICICI Bank. Each category had three hundred images from public datasets. Data sets for testing (20%) and training (80%) were kept apart.

3.2. Models for Training

NCDR Teachable Machine was used to upload the dataset, and the following steps were taken:

Labeling: Images were grouped based on their labels.

Training Specifications: We used the default parameters of MobileNet and an 80/20 train-test split.

Instruction: The training session lasted two minutes and was completed using browser-based resources.

3.3. Evaluation of the Model

The training model was evaluated using the test dataset. Calculations were made for metrics such as F1-score, recall, accuracy, and precision.

IV. FINAL RESULTS

Model Performance

The model's average accuracy on the test set was 96%, and the confusion matrix revealed that cats and dogs were most often misclassified due to their apparent similarities.

Metric Value Precision 95% Accuracy 96% 97% recall

F1-Score: 96%

Scalability & Usability

NCDR Teachable Machine's intuitive user interface (UI) makes it suitable for non-technical users, but its reliance on browser resources limits its scalability for larger datasets. Exporting the model to Tensor Flow Lite allowed for deployment on mobile devices, showcasing its potential for real-time applications like retail inventory management and wildlife monitoring. The model's efficacy should be increased with proper design and implementation; research studies and Google's Teachable Machine have shown that its efficiency has been studied in the range of 86-90%.

The efficacy obtained from our model is 96%, which is an excellent comparison. This implies that the model is correctly constructed and applied according to the AI classification research and studies

V. CONCLUSIONS

Despite its great accessibility and simplicity, NCDR Teachable Machine's scalability and customization issues require attention in future developments. This study demonstrates that NCDR Teachable Machine is a powerful tool for developing prediction models for picture identification, especially for individuals with limited technical knowledge.

VI. IMPLEMENTATIONS OF THE SOLUTION

Future research should focus on improving scalability for large datasets, looking into how it may be used with time-series image data, and combining the Teachable Machine with state-of-the-art frameworks to create hybrid solutions.

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