

# Real-Time Comparative Evaluation of ML and DL Models for Object Classification on a Unified Dataset

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**Abstract:** *Our project presents a comparative study of multiple machine learning and deep learning models for object detection and classification using a common dataset of classes with same number of attributes defined to each model. The models include YOLO, (SVM) Support Vector Machine, Decision Tree, and Random Forest, KNN (K-Nearest Neighbours), CNN (Convolutional Neural Networks), ResNet18, MobieNet. And the reason behind choosing these kind of models is the ability of the algorithm to handle complex type of images and learning those images in particular way. Hence through this comparison it helps in understanding the strengths and limitations of each model approach. Images we have added to the dataset are belonging to categories such as animals like cats, dogs, watches, birds, human faces and car's for the training and testing. We developed a Web-based interface or frontend developed using Flask allows the users to upload images or capture them through a webcam for real time testing. Also user are allowed to drag and drop the images from their device individually. Hence users are enable to compare and difference between the models easily and efficiently. Each model generates predictions and corresponding accuracy metrics, which ensures a fair and real comparison of performance under several identical conditions. The results or output we get in last let us know the comparative and efficient analysis between deep learning models as well as machine learning models.*

**Keywords:** machine learning

