

Analysis Report

Steps to Train a deep learning classifier and Machine learning models for any binary image classification and compare the performance of your deep learning model with three traditional machine learning models to evaluate on the same test dataset.

Collect and preprocess data: collected chest x-ray data set of normal and pneumonia person and preprocess it to make it suitable for the model. This includes tasks such as cleaning the data, removing outliers, and normalizing the data.

Choose an appropriate model:

There are various deep learning models such as Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNNs), and Deep Belief Networks (DBNs). Here we choose CNNs for our project. For Traditional Machine learning, we use K-nearest neighbor (KNN), Support vector classifier (SVC) and Decision tree Classifier (DTC).

Train the model: Train the model on the pre-processed data using an appropriate optimizer and loss function. This step involves feeding the data to the model and adjusting the model parameters iteratively to minimize the loss function.

Validate the model: Validate the model on a separate dataset to check its accuracy and generalization capability. This step helps to avoid over-fitting and ensures that the model can perform well on new, unseen data.

Test the model: Test the model on a new data set to check its performance. This step helps to Analyze the model's adaptability to test data.

Deploy the model: Deploy the trained model for real-world use. This can involve creating an API or integrating the model into an existing application.

The Accuracy of Machine Learning models and deep learning model was shown in below table:

Models	precision		recall		f1-score		Accuracy
	0	1	0	1	0	1	
CNN	0.35	0.61	0.25	0.84	0.20	0.71	60
SVC	0.94	0.73	0.39	0.98	0.55	0.84	76
DTC	0.78	0.72	0.40	0.93	0.53	0.81	73
K-NN	0.97	0.69	0.25	0.99	0.40	0.81	72

Conclusion: The process for conclusion of traditional machine learning models is similar to that of deep learning models, but the difference lies in the algorithms used and the complexity of the models. Deep learning models can handle more complex tasks and larger datasets, while traditional machine learning models are simpler and can handle smaller datasets.