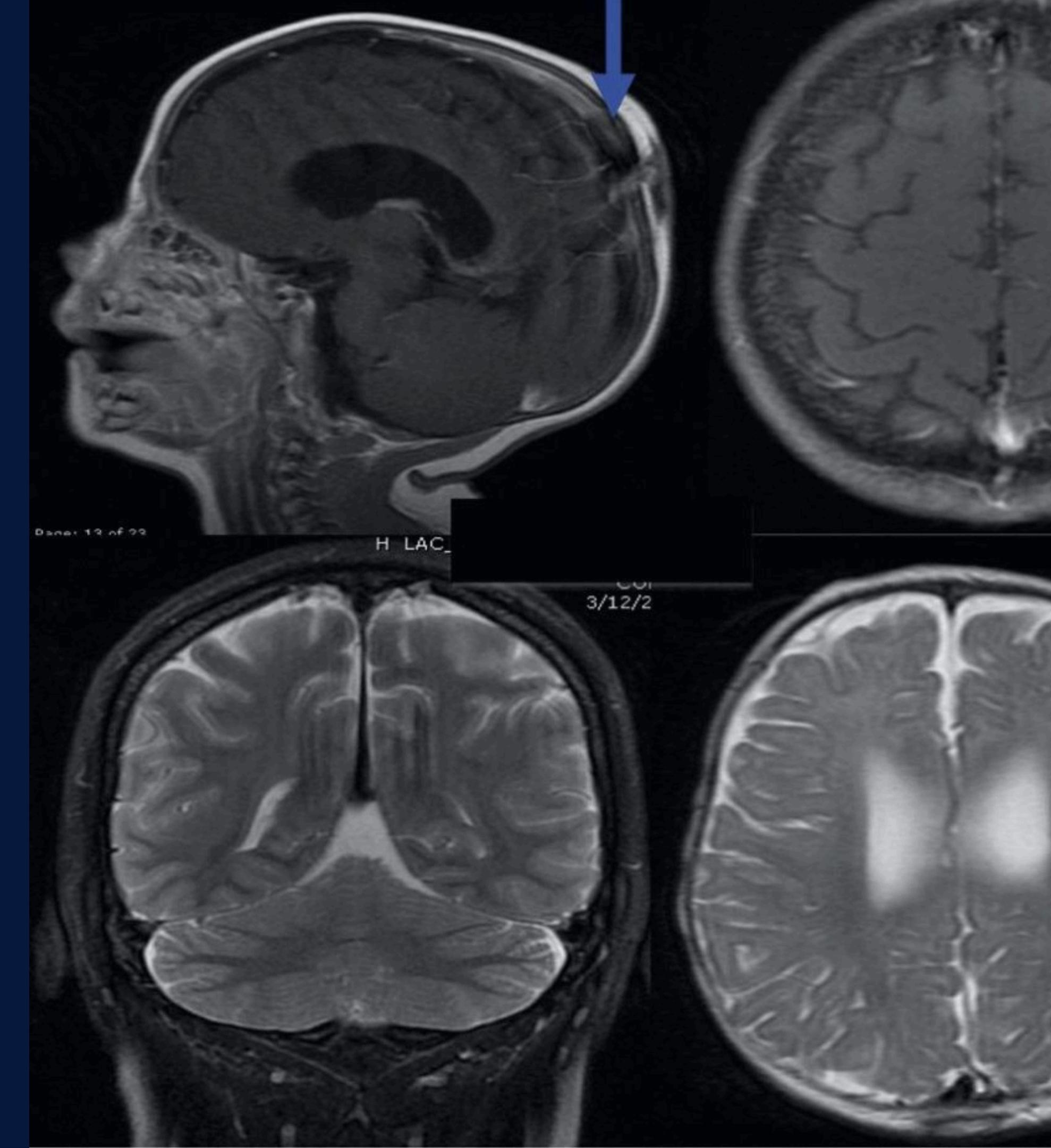


Alzheimer MRI Classification Using CNN

This presentation will introduce my project on categorizing the stages of Alzheimer's disease by CNN.



Project Objective

The application of automated classification methods using machine learning and artificial intelligence shows higher accuracy compared to manual classification of Alzheimer's disease stages.

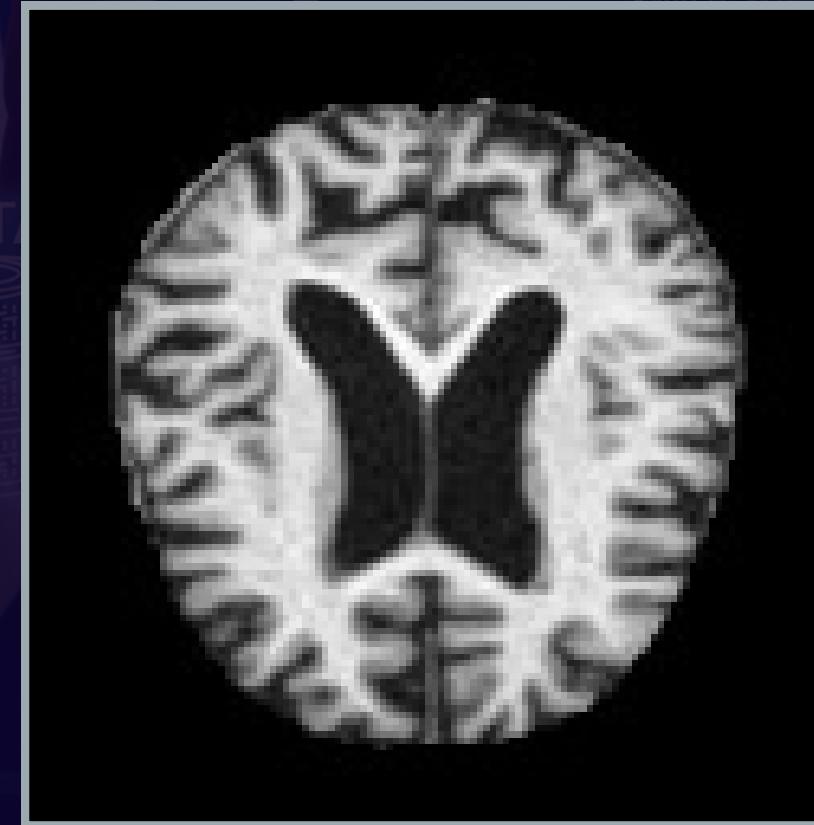
Proposing a system based on deep learning algorithms using CNN, ANN and TL can greatly facilitate the task of physicians in detecting and classifying Alzheimer's disease worldwide.



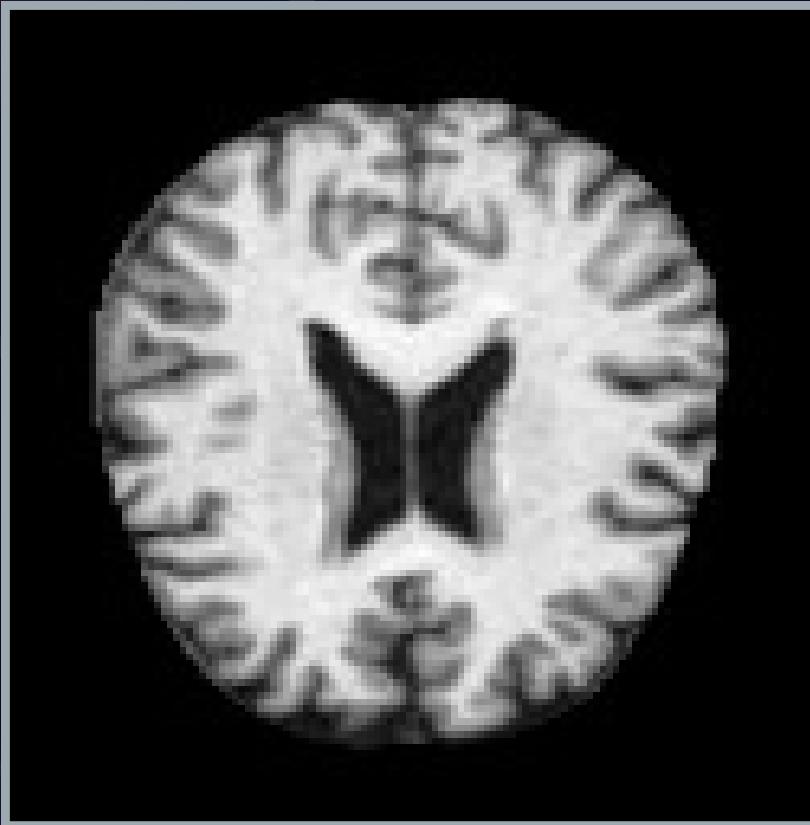
Stages of Alzheimer's disease



Mild Demented



Moderate
Demented



non Demented



Very Mild
Demented

Model: "sequential_1"

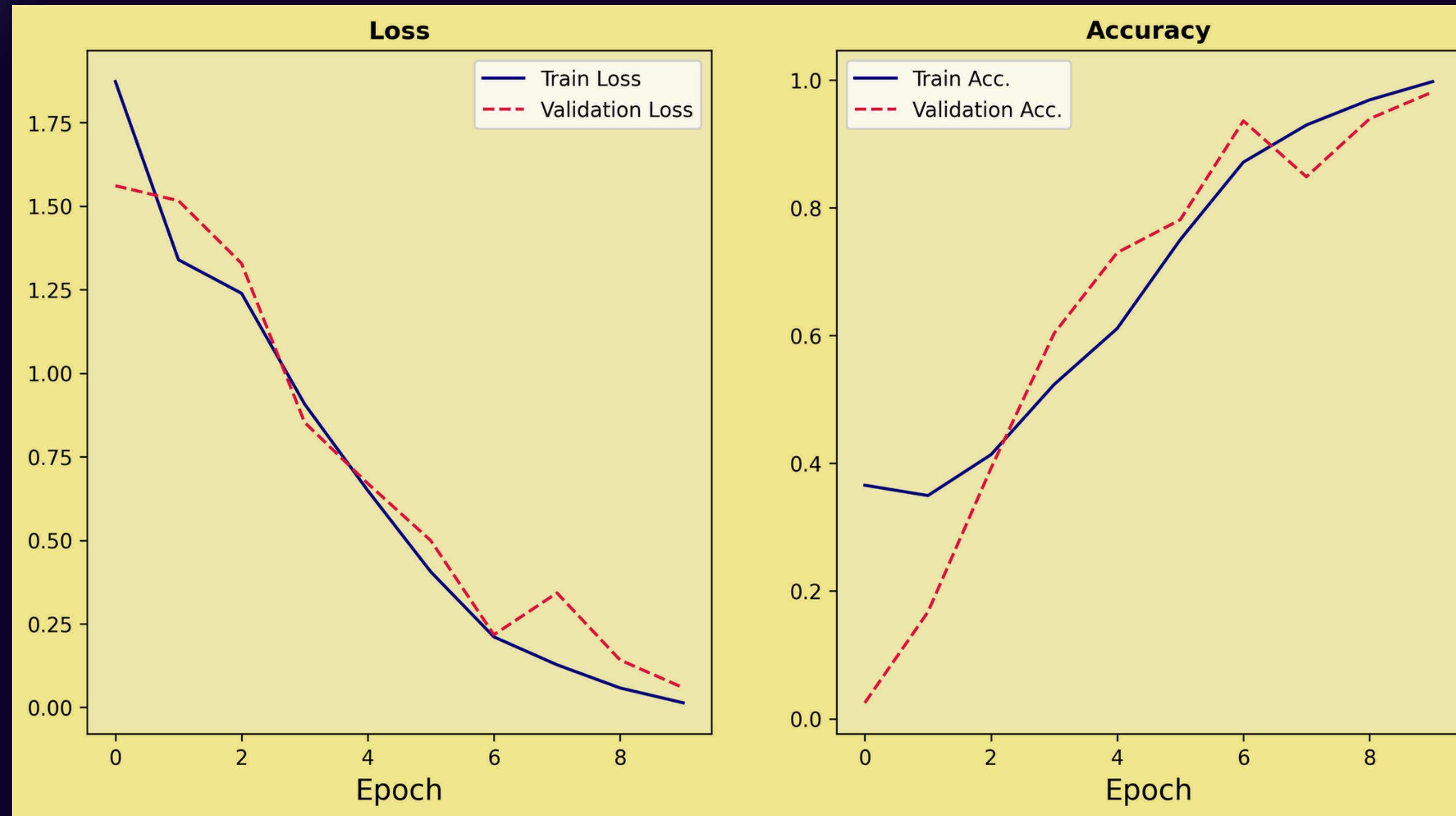
Layer (type)	Output Shape	Param #
conv2d_3 (Conv2D)	(None, 126, 126, 16)	448
max_pooling2d_3 (MaxPooling2D)	(None, 63, 63, 16)	0
conv2d_4 (Conv2D)	(None, 61, 61, 32)	4640
max_pooling2d_4 (MaxPooling2D)	(None, 30, 30, 32)	0
conv2d_5 (Conv2D)	(None, 28, 28, 128)	36992
max_pooling2d_5 (MaxPooling2D)	(None, 14, 14, 128)	0
flatten_1 (Flatten)	(None, 25088)	0
dense_3 (Dense)	(None, 128)	3211392
dense_4 (Dense)	(None, 64)	8256
dense_5 (Dense)	(None, 4)	260
<hr/>		
Total params:	3261988 (12.44 MB)	
Trainable params:	3261988 (12.44 MB)	
Non-trainable params:	0 (0.00 Byte)	

My Model

My model is a convolutional neural network (CNN) for classifying 128x128 images with three color channels. It consists of three convolutional layers with 16, 32, and 128 filters, each using a ReLU activation function and initialization of he_normal weights, and subsampling (MaxPooling) layers after each convolutional layer. The convolution layers are followed by a Flatten layer to convert the 2D data into a one-dimensional vector, followed by two full-connectivity layers with 128 and 64 neurons, respectively, that use ReLU as the activation function. The final layer consists of four neurons with softmax activation function for multi-class classification. The model is compiled using Adam optimizer and sparse_categorical_crossentropy loss function and evaluated using accuracy metric.

Results

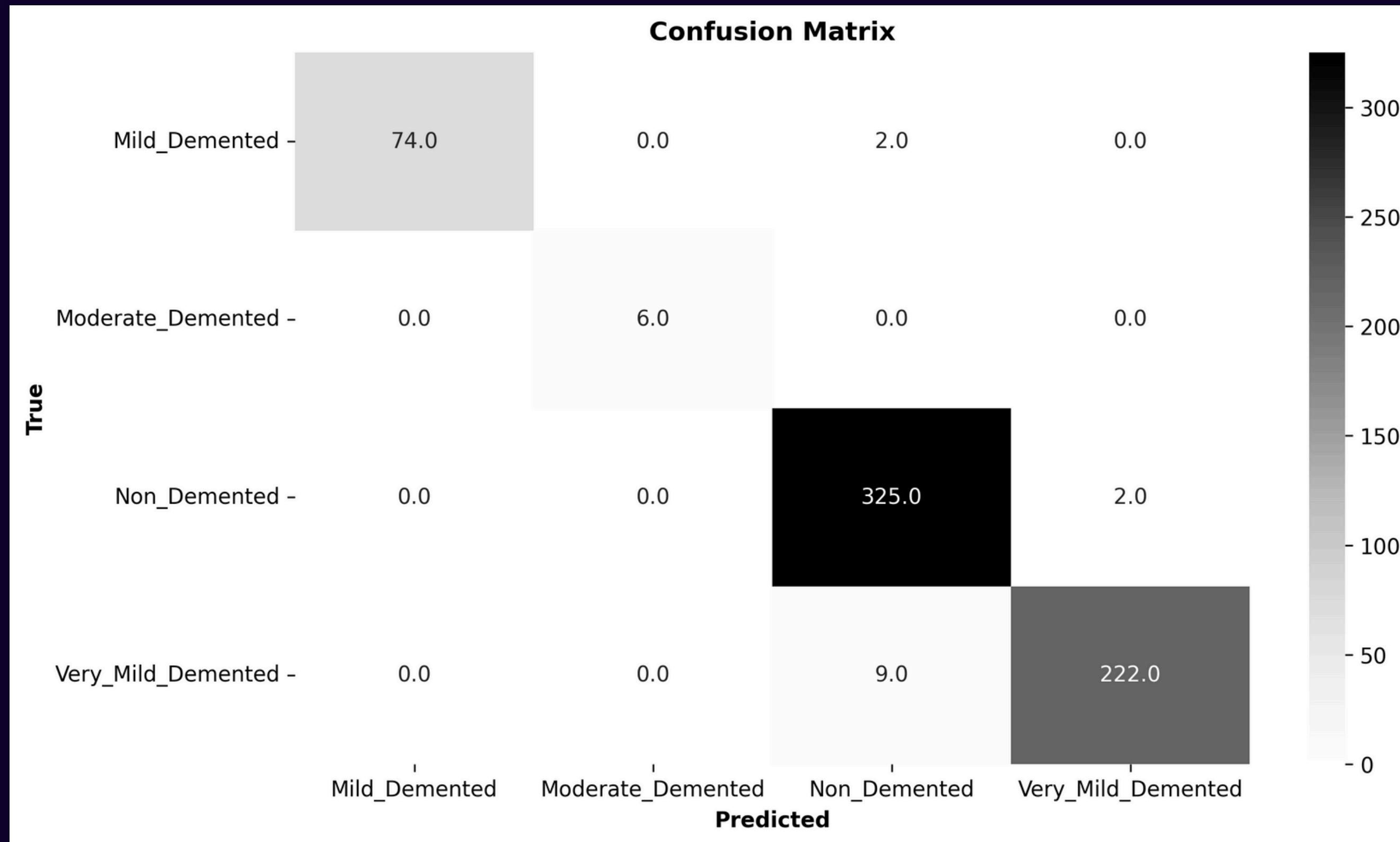
05





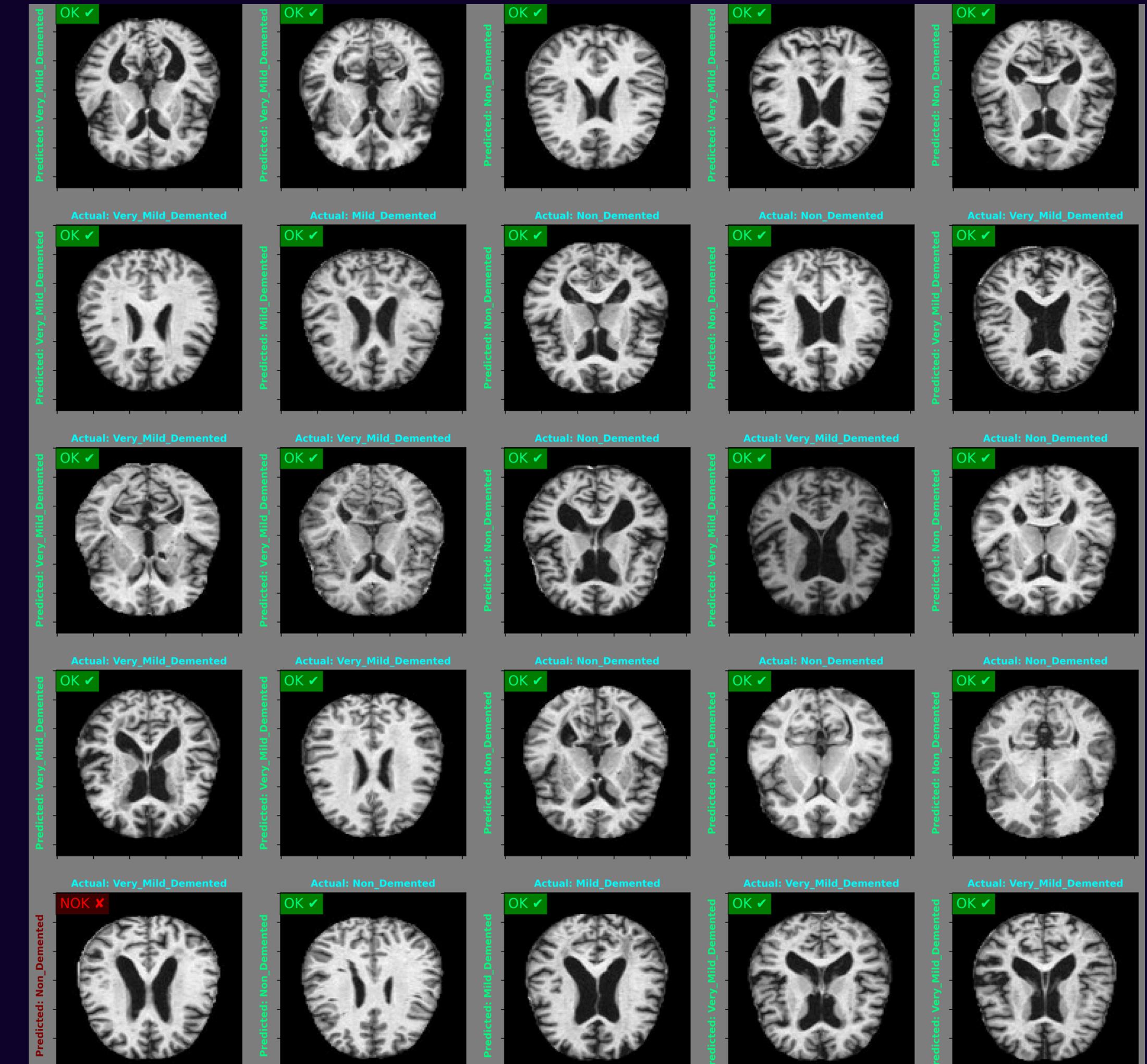
Confusion Matrix

06



My predictions:

OP



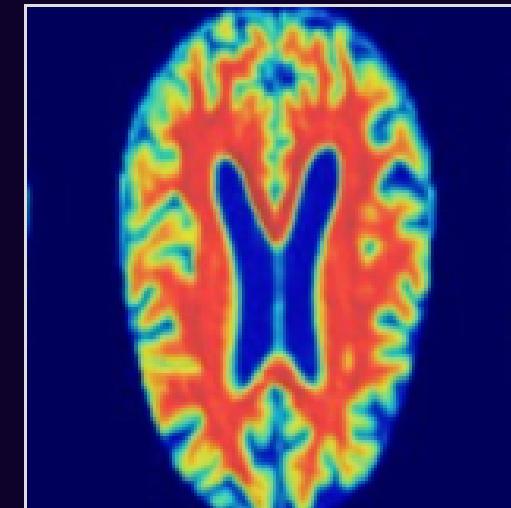
SOURCES:



Convolutional Neural Networks, Explained

Let's build your first CNN model

Towards Data Science / Dec 15, 2021



Alzheimer MRI Preprocessed Dataset

Preprocessed Alzheimer Disease MRI (Magnetic Resonance Imaging)

 kaggle.com

<https://www.sciencedirect.com/science/article/pii/S1319157824000296>

THANK YOU FOR YOUR ATTENTION

