INTERN LEVEL 1 - STARTER PROJECT - CAT AND DOG CLASSIFIER

In this level, you will learn the basic workflow of deep learning projects by building an image classifier using CAT and DOG Dataset.

Dataset Link: https://www.microsoft.com/en-us/download/details.aspx?id=54765
Framework: > Tensorflow 2.0 (Current Stable version TF2.2)

TASK 1:

Step 1: Download the Dataset and get familiar with the organization of data.

Step 2: Plan how you will prepare the data to feed to your data processor. (E.g. Maybe you want to create a new csv or excel file with all the necessary information or feed the current structure itself to the data processor).

Step 3: Create data processors for Training and Testing/Validation. There are many ways to handle data - Keras Sequences, Keras Generators, TF.Data Pipelines. (Rule of Thumb: Never show testing/validation data to your model while training).

Step 4: Create your own Neural network with Convolution layers, Max Pool Layers, Dense Layers, Dropout layers from scratch (Use Keras API to define the network and not use any existing neural networks - such as VGG16, Resnet, etc.).

Step 5: Train your model and measure the performance of your neural network and document it. Performance includes – Accuracy, loss other metrics of measurement for Train, Val, Test, Size of the model, Time taken for forward Path (Inference Time).

Step 6: Create an inference function/script to load and perform prediction on the trained model.

Step 7: ***Explainable AI*** – Create heatmap aka GRAD-CAM to visualize what your AI/ML model is seeing to arrive at the decision. Use the TF-EXPLAIN library to do the same.

Step 8: Document your findings and upload your project to GitHub repo shared with you.

TASK 2:

1. In Task 1 Step 3, use image augmentation with your data processors.
2. In Task 1 Step 4, use known networks (such as VGG16, Resnet, etc.) to train your AI model.

3. Measure performance and compare it with your own model. Repeat all the steps of T1.

BONUS TASK:

1. Use FastAPI to create an API server to host your model and get predictions.

INTERNSHIP LEVEL INFO:

We have designed this internship track with the goal of introducing to you AI/ML workflow. Each level will introduce new concepts and the difficulty level will increase accordingly. There is no time limit on the level. The faster you complete you progress to the next level. Once you have progressed through enough levels, you will be called upon to work on practical problems that AiBharata is working on. These levels will equip you with tool sets required to succeed in the field of AI/ML.