

2. AI Engine

The AI Engine has the following components:

Dataset Downloader:

This component is the other part of the upload dataset component in part 1 and provide the functionality to download the dataset, we give it the database information and the bucket information, first it lists the data points from database (biqQuery) then it actually downloads the data from data bucket.

AI Model:

This component is the basic model to train on the test data and then predict the given audio file. While training it keep on saving the model if its accuracy is better than the previous one as file best_model.hdf5, so we can directly load and use the model without going through training phase the next time, however one can choose the enhance the accuracy of model by further t or can opt for training from scratch.

Cloud hosted AI Engine:

Both the above components are merged inside a Cloud hosted VM and exposed via Fast API. FastAPI has the following APIs exposed:

End Point	Params	Description
/	-	It is the default endpoint that hit when someone access the Docker container and it verifies the container is up
/install_dependencies	-	This end point installs all the libraries needed for the model/database/bucket to run, libraries were supposed to be installed on container start but was getting too many error so created it as an endpoint
/hello	name :str	This end point greets the user by name
/download	root:str, table:str	This api download data from the cloud, root the root of google bucket and table is the table of google bigQuery database
/init_model	already_trained:bool	Initialize the AI model
/upload_file	audio:file	Upload audio file to predict
/predict	-	predict the file uploaded in /upload_file API

File structure help:

best_model.hdf5: it is the best model created in the Model generation

best_quantized_model.hdf5: it is the best quantized model created in Quantized model generation

Download dataset.ipynb: Note book to provide data download functionality

Model.ipynb: Notebook to provide AI model functionality and create best_model

Model-Quantized.ipynb: Notebook to provide quantized model functionality and create quantizedmodel

myfirstproject-305412-bd26f6fbb24b.json : Google credentials file

app: Folder to be copied in the cloud VM

app__init__.py: make it a python package

app\ best_model.hdf5: it is the best model created in the previous Model generation

app\download_dataset.py: Python file to provide data download functionality

app\ main.py: FastAPI APIs file

app\model.py: Python file to provide AI model functionality

app\myfirstproject-305412-bd26f6fbb24b.json: Google credentials file