

2. AI Engine

The AI Engine has the following components:

Dataset Downloader:

This component is the other part of the upload dataset component in 1 and provided 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 keeps 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 to enhance the accuracy of model by further training or can opt for training from scratch.

Docker container and Fast API:

Both the above components are merged inside a Docker container and exposed via Fast API. FastAPI has the following APIs exposed:

End Point	Params	Description
/	-	Its 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
/init	-	This end point simply initializes the data and model class, we do it after the install_dependencies has installed the dependencies
/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 8

File structure help:

.dockerignore : It lists the files to be ignored while creating a Docker container
best_model.hdf5 : it is the best model created in the previous Model generation
docker-commands.txt : Lists the commands to setup Docker container
DockerFile : File to create Docker container
Download dataset.ipynb : Note book to provide data download functionality
Model.ipynb : Notebook to provide AI model functionality
myfirstproject-305412-bd26f6fbb24b.json : Google credentials file

app : Folder to be copied in the docker container
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