

Sprint-4

Train The Model On IBM

Train The Model on IBM Watson

| | |
|-------------|--|
| Date | 19 Nov 2022 |
| TeamID | PNT2022TMID52880 |
| ProjectName | Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation |

TASK:

Train The Model on IBM Watson:

GO TO WATSON STUDIO SERVICES AND LAUNCH IT:

The screenshot shows the IBM Cloud Watson Studio service page. The browser address bar displays the URL: cloud.ibm.com/services/data-science-experience/cm%3Av1%3Abluemix%3Apublic%3Adata-science-experience%3Aus-south%3Aa%2F22db4b20ccab493992d3225cfb88e028%3A261d1c.... The page header includes the IBM Cloud logo, a search bar, and navigation links for Catalog, Manage, and the user profile (keerthana reddy R's Ac...). The main content area features the Watson Studio logo and the text "Watson Studio in Cloud Pak for Data". Below this, a description states: "Watson Studio is one of the core services in Cloud Pak for Data as a Service. Build, deploy and manage AI models, and optimize decisions on IBM Cloud Pak for Data." A blue button labeled "Launch in IBM Cloud Pak for Data" is prominently displayed. To the right, a diagram illustrates the architecture, showing "IBM Watson Studio in Cloud Pak for Data" as a component of the "IBM Cloud Pak for Data Unifying platform", which sits on top of the "IBM Cloud Base cloud infrastructure". At the bottom, there are three sections for "Helpful links": "Documentation" (Learn about tools, features, and how to perform a wide variety of Data and AI tasks.), "Learning path" (Start a step-by-step tutorial to get up and running quickly.), and "Videos" (Watch videos to learn about Watson Studio and Cloud Pak for Data as a Service.).

IBM CLOUD PAK LOGIN:

Service Details - IBM Cloud x IBM Cloud Pak for Data x IBM Watson Studio x IBM Watson Studio x +

datapatform.cloud.ibm.com/login?context=cpdaas

IBM Cloud Pak for Data Gallery Blog Docs

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login.ibm.com/authsvc/mtfm/sps/authsvc?PolicyId=urn:ibm:security:authentication:asf:basicdapuser&login_hint=keerthana19047%40ece.ssn.edu.in&Target=https%3A%2F%2Flogin.ibm.com...

IBM

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Step through implementing a Data fabric use case in a sample project.

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Create a project for your team to prepare data, find insights, or build models.

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Stay current with new features, enhancements, and other changes.

Quick start

- Create data pipelines with DataStage
- Build customer profiles with IBM Match 360 with Watson
- Catalog and govern data with Watson Knowledge Catalog
- Build and manage ML models with Watson Studio
- Query data anywhere with Watson Query

Projects

| Project Name | Last Modified |
|--------------------|-----------------------|
| arrythmia | Yesterday at 09:30 PM |
| classification_cnn | Yesterday at 08:48 AM |

Notifications

Online deployment ready
The online deployment **classification_cnn** is ready to accept requests.
Yesterday at 10:05 PM

Deployments

| Deployment Name | Last Modified |
|--------------------|-----------------------|
| cnn_classification | Yesterday at 07:42 PM |
| classification_cnn | Yesterday at 08:07 PM |

OPEN PROJECTS:

Projects / arrythmia

Overview **Assets** Jobs Manage

Find assets Import assets New asset

4 assets

All assets

Asset types

- Data (3)
- Data assets (3)**
- Notebooks (1)

Data assets

| Name | Last modified |
|--|---------------------------------|
| fig_30.png PNG | 13 hours ago Modified by you |
| Classification of Arrhythmia by Using Deep Learning w... application/x-zip-compressed | 14 hours ago Modified by you |
| Classification of Arrhythmia by Using Deep Learning w... application/x-zip-compressed | 14 hours ago Modified by you |

Items per page: 20 1-3 of 3 items 1 of 1 pages

Data in this project

Drop data files here or browse for files to upload

OPEN JUPYTER NOTEBOOK:

Service Details - IBM Cloud x IBM Watson Studio x cnn_arrythmia - IBM Watson Studio x IBM Watson Studio x +

dataplatfom.cloud.ibm.com/projects/b2a41678-2ab6-4a6a-bafb-b8b9224d417d/assets?context=cpdaas

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Projects / arrythmia

Overview Assets Jobs Manage

Find assets Import assets New asset +

4 assets

All assets

Asset types

Data 3

Data assets 3

Notebooks 1

Notebooks

| Name | Language | Last modified |
|------------------------|------------|------------------------------|
| cnn_arrythmia Notebook | Python 3.9 | 13 hours ago Modified by you |

Items per page: 20 1-1 of 1 items 1 of 1 pages

Data in this project

Drop data files here or browse for files to upload

LOADING DATA AND IMAGE PREPROCESSING:

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dataplatfom.cloud.ibm.com/analytics/notebooks/v2/cffd8e35-412f-4975-b4cf-26b84edd8201/view?projectId=b2a41678-2ab6-4a6a-bafb-b8b9224d417d&context=cpdaas

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Projects / arrythmia / cnn_arrythmia

```
In [1]: pwd

Out[1]: '/home/wsuser/work'

In [2]: !pip install keras
!pip install tensorflow

Requirement already satisfied: keras in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (2.7.0)
Requirement already satisfied: tensorflow in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (2.7.2)
Requirement already satisfied: gast<0.5.0,>=0.2.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.4.0)
Requirement already satisfied: keras<2.8,>=2.7.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: wrapt<1.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.12.1)
Requirement already satisfied: flatbuffers<3.0,>=1.12 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.0)
Requirement already satisfied: tensorflow-io-gcs-filesystem<=0.21.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.23.1)
Requirement already satisfied: typing-extensions<=3.6.6 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (4.1.1)
Requirement already satisfied: wheel<1.0,>=0.32.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.37.0)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.42.0)
Requirement already satisfied: numpy<1.14.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.20.3)
Requirement already satisfied: google-pasta<=0.1.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.2.0)
Requirement already satisfied: protobuf<=3.9.2 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (3.19.1)
Requirement already satisfied: tensorflow-estimator<2.8,>=2.7.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: termcolor<=1.1.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.1.0)
Requirement already satisfied: absl-py<=0.4.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.12.0)
Requirement already satisfied: keras-preprocessing<=1.1.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.1.2)
Requirement already satisfied: six<=1.12.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.15.0)
Requirement already satisfied: astunparse<=1.6.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.6.3)
Requirement already satisfied: tensorflow-data-server<2.7 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.7.0)
Requirement already satisfied: h5py<=2.9.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (3.2.1)
Requirement already satisfied: opt-einsum<=2.3.2 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (3.3.0)
Requirement already satisfied: tensorflow-board-server<0.7.0,>=0.6.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.6.1)
Requirement already satisfied: google-auth<3,>=1.6.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.23.0)
Requirement already satisfied: tensorflow-plugin<=1.6.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.6.0)
Requirement already satisfied: tensorflow-plugin<=1.6.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (1.6.0)
Requirement already satisfied: google-auth-oauthlib<0.5,>=0.4.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (0.4.4)
Requirement already satisfied: werkzeug<=0.11.15 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.0.2)
Requirement already satisfied: setuptools<=41.0.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (58.0.4)
Requirement already satisfied: requests<3,>=2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from tensorflow) (2.26.0)
```

```
Service Details - IBM Cloud x cnn_arrhythmia - IBM Watson Stu x cnn_arrhythmia - IBM Watson Stu x IBM Watson Studio x +
dataplatform.cloud.ibm.com/analytics/notebooks/v2/cffd8e35-412f-4975-b4cf-26b84edd8201/view?projectid=b2a41678-2ab6-4a6a-bafb-b8b9224d417d&context=cpdaas
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Requirement already satisfied: idna<4,>=2.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests<3,>=2.21.0->tensorflow==2.7->tensorflow) (3.3)
Requirement already satisfied: certifi>=2017.4.17 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests<3,>=2.21.0->tensorflow==2.7->tensorflow) (2022.9.24)
Requirement already satisfied: oauthlib>=3.0.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests-oauthlib>=0.7.0->google-auth-oauthlib<0.5,>=0.4.1->tensorflow==2.7->tensorflow) (3.2.1)

In [3]: import keras
keras.__version__

Out[3]: '2.7.0'

In [4]: import tensorflow
tensorflow.__version__

Out[4]: '2.7.2'

In [5]: import os, types
import pandas as pd
from botocore.client import Config
import ibm_boto3

def __iter__(self): return 0

# @hidden_cell
# The following code accesses a file in your IBM Cloud Object Storage. It includes your credentials.
# You might want to remove those credentials before you share the notebook.
cos_client = ibm_boto3.client(service_name='s3',
                              ibm_api_key_id='01R72q70xHPuH8ZxQKIT59YvEvnD-1_Tpa87NRZC3bi5',
                              ibm_auth_endpoint='https://iam.cloud.ibm.com/oidc/token',
                              config=Config(signature_version='oauth'),
                              endpoint_url='https://s3.private.us.cloud-object-storage.appdomain.cloud')

bucket = 'arrhythmia-donotdelete-pr-gdt123328bk830'
object_key = 'Classification of Arrhythmia by Using Deep Learning with 2-D ECG Spectral Image Representation.zip'

streaming_body_1 = cos_client.get_object(Bucket=bucket, Key=object_key)['Body']

# Your data file was loaded into a botocore.response.StreamingBody object.
# Please read the documentation of ibm_boto3 and pandas to learn more about the possibilities to load the data.
```

```
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streaming_body_1 = cos_client.get_object(bucket=bucket, key=object_key)['Body']

# Your data file was loaded into a botocore.response.StreamingBody object.
# Please read the documentation of ibm_boto3 and pandas to learn more about the possibilities to load the data.
# ibm_boto3 documentation: https://ibm.github.io/ibm-cos-sdk-python/
# pandas documentation: http://pandas.pydata.org/

In [6]: from io import BytesIO
import zipfile
unzip=zipfile.ZipFile(BytesIO(streaming_body_1.read()),'r')
file_paths=unzip.namelist()
for path in file_paths:
    unzip.extract(path)

In [7]: filenames=os.listdir('/home/wsuser/work/data')
print(filenames)

['train', 'test']

In [8]: import numpy as np
import tensorflow as tf
from tensorflow.keras import keras
from keras.preprocessing.image import ImageDataGenerator
from tensorflow.keras.models import Sequential
from tensorflow.keras import layers
from tensorflow.keras.layers import Dense, Flatten
from tensorflow.keras.layers import Conv2D, MaxPooling2D

In [9]: train_path = r"/home/wsuser/work/data/train"
test_path = r"/home/wsuser/work/data/test"

In [10]: train_datagen = ImageDataGenerator(rescale=1./255, shear_range = 0.2, zoom_range=0.2, horizontal_flip = True)
test_datagen = ImageDataGenerator(rescale=1./255)

In [11]: x_train = train_datagen.flow_from_directory(directory = train_path, target_size=(64,64), batch_size=32, class_mode = "categorical")
x_test = train_datagen.flow_from_directory(directory =test_path, target_size=(64,64), batch_size=32, class_mode= "categorical")

Found 15341 images belonging to 6 classes.
Found 6825 images belonging to 6 classes.
```

MODEL BUILDING:

```
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datapatform.cloud.ibm.com/analytics/notebooks/v2/cffd8e35-412f-4975-b4cf-26b84edd8201/view?projectid=b2a41678-2ab6-4a6a-bafb-b8b9224d417d&context=cpdaas
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In [12]: model=Sequential()

In [13]: model.add(Conv2D(32,(3,3),input_shape=(64,64,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))

model.add(Conv2D(32,(3,3),activation='relu'))
model.add(MaxPooling2D(pool_size=(2,2)))

model.add(Flatten())

model.add(Dense(32))
model.add(Dense(6, activation='softmax'))
```

```
Service Details - IBM Cloud x cnn_arrythmia - IBM Watson Stl x cnn_arrythmia - IBM Watson Stl x IBM Watson Studio x +
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In [14]: model.summary()

Model: "sequential"

Layer (type) Output Shape Param #
-----
conv2d (Conv2D) (None, 62, 62, 32) 896

max_pooling2d (MaxPooling2D) (None, 31, 31, 32) 0

conv2d_1 (Conv2D) (None, 29, 29, 32) 9248

max_pooling2d_1 (MaxPooling2D) (None, 14, 14, 32) 0

flatten (Flatten) (None, 6272) 0

dense (Dense) (None, 32) 200736

dense_1 (Dense) (None, 6) 198

Total params: 211,078
Trainable params: 211,078
Non-trainable params: 0
```

TRAINING THE MODEL IN CLOUD AND SAVING IT:

```
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Projects / arrythmia / cnn_arrythmia

In [15]: model.compile(optimizer='adam', loss='categorical_crossentropy', metrics=['accuracy'])

In [16]: model.fit(x=x_train, epochs=5, validation_data=x_test)

Epoch 1/5
480/480 [=====] - 99s 206ms/step - loss: 0.6400 - accuracy: 0.7881 - val_loss: 0.5142 - val_accuracy: 0.8315
Epoch 2/5
480/480 [=====] - 99s 205ms/step - loss: 0.2763 - accuracy: 0.9188 - val_loss: 0.4390 - val_accuracy: 0.8478
Epoch 3/5
480/480 [=====] - 97s 201ms/step - loss: 0.2311 - accuracy: 0.9339 - val_loss: 0.4033 - val_accuracy: 0.8692
Epoch 4/5
480/480 [=====] - 98s 205ms/step - loss: 0.1917 - accuracy: 0.9445 - val_loss: 0.3459 - val_accuracy: 0.8853
Epoch 5/5
480/480 [=====] - 98s 204ms/step - loss: 0.1625 - accuracy: 0.9500 - val_loss: 0.3364 - val_accuracy: 0.8907

Out[16]: <keras.callbacks.History at 0x7f6c74380760>

In [17]: model.save('ECG.h5')

In [18]: !tar -zcvf classification_cnn.tgz ECG.h5

ECG.h5

In [19]: ls -l

total 4532
-rw-rw---- 1 wsuser wscommon 2054587 Nov 18 16:28 classification_cnn.tgz
drwxr-xr-x 4 wsuser wscommon 4096 Nov 18 16:19 data/
-rw-rw---- 1 wsuser wscommon 2579272 Nov 18 16:28 ECG.h5
```

DEPLOYING THE MODEL IN IBM WATSON:

```
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datapatform.cloud.ibm.com/analytics/notebooks/v2/cffd8e35-412f-4975-b4cf-26b84edd8201/view?projectId=b2a41678-2ab6-4a6a-bafb-b8b9224d417d&context=cpdaas
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Projects / arrythmia / cnn_arrythmia

In [20]: !pip install watson-machine-learning-client --upgrade

Collecting watson-machine-learning-client
  Downloading watson_machine_learning_client-1.0.391-py3-none-any.whl (538 kB)
    538 kB 20.1 MB/s eta 0:00:01
Requirement already satisfied: ibm-cos-sdk in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (2.11.0)
Requirement already satisfied: tabulate in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (0.8.9)
Requirement already satisfied: requests in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (2.26.0)
Requirement already satisfied: lomond in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (0.3.3)
Requirement already satisfied: tqdm in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (4.62.3)
Requirement already satisfied: certifi in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (2022.9.24)
Requirement already satisfied: urllib3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (1.26.7)
Requirement already satisfied: boto3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (1.18.21)
Requirement already satisfied: pandas in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from watson-machine-learning-client) (1.3.4)
Requirement already satisfied: jmespath<1.0.0,>=0.7.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from boto3->watson-machine-learning-client) (0.10.0)
Requirement already satisfied: botocore<1.22.0,>=1.21.21 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from boto3->watson-machine-learning-client) (1.21.41)
Requirement already satisfied: s3transfer<0.6.0,>=0.5.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from boto3->watson-machine-learning-client) (0.5.0)
Requirement already satisfied: python-dateutil<3.0.0,>=2.1 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from botocore<1.22.0,>=1.21.21->boto3->watson-machine-learning-client) (2.8.2)
Requirement already satisfied: six>=1.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from python-dateutil<3.0.0,>=2.1->botocore<1.22.0,>=1.21.21->boto3->watson-machine-learning-client) (1.15.0)
Requirement already satisfied: ibm-cos-sdk-s3transfer==2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk->watson-machine-learning-client) (2.11.0)
Requirement already satisfied: ibm-cos-sdk-core==2.11.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from ibm-cos-sdk->watson-machine-learning-client) (2.11.0)
Requirement already satisfied: idna<4,>=2.5 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests->watson-machine-learning-client) (3.3)
Requirement already satisfied: charset-normalizer==2.0.0 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from requests->watson-machine-learning-client) (2.0.4)
Requirement already satisfied: pytz>=2017.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from pandas->watson-machine-learning-client) (2021.3)
Requirement already satisfied: numpy>=1.17.3 in /opt/conda/envs/Python-3.9/lib/python3.9/site-packages (from pandas->watson-machine-learning-client) (1.20.3)
Installing collected packages: watson-machine-learning-client
Successfully installed watson-machine-learning-client-1.0.391

In [21]: from ibm_watson_machine_learning import APIClient
        wml_credentials={"url": "https://us-south.ml.cloud.ibm.com",
        "apikey": "e391_fnd4fxBviY9N30ixk_4TtwSvbqDKHsEAp1mKf"}
        client = APIClient(wml_credentials)

In [22]: def guid_from_space_name(client, space_name):
        space_client.spaces.get_details()
        return (next(item for item in space['resources'] if item['entity']['name']==space_name)['metadata']['id'])
```

```
Service Details - IBM Cloud x cnn_arrythmia - IBM Watson St... x cnn_arrythmia - IBM Watson St... x IBM Watson Studio x +
datapatform.cloud.ibm.com/analytics/notebooks/v2/cffd8e35-412f-4975-b4cf-26b84edd8201/view?projectId=b2a41678-2ab6-4a6a-bafb-b8b9224d417d&context=cpdaas
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Projects / arrythmia / cnn_arrythmia

In [23]: space_uid=guid_from_space_name(client, 'classification_cnn')
        print("Space UID="+space_uid)

        Space UID=2597d5f1-b4d1-4484-a0ef-c0f3678fb565

In [24]: client.set.default_space(space_uid)

Out[24]: 'SUCCESS'

In [25]: client.software_specifications.list()

-----
NAME                               ASSET_ID                                TYPE
default_py3.6                     0062b8c9-8b7d-44a0-a9b9-46c416adcbd9   base
kernel-spark3.2-scala2.12         020d69ce-7ac1-5e68-ac1a-31189867356a   base
pytorch-onnx_1.3-py3.7-edt       069ea134-3346-5748-b513-49120e15d288   base
scikit-learn_0.20-py3.6         09c5a1d0-9c1e-4473-a344-eb7b665ff687   base
spark-mllib_3.0-scala_2.12       09f4cf0-90a7-5899-b9ed-1ef348aebdee     base
pytorch-onnx_rt22.1-py3.9       0b848dd4-e681-5599-be41-b5f6fccc6471   base
ai-function_0.1-py3.6           0cdb0f1e-5376-4f4d-92dd-da3b69a9bda     base
shiny-r3.6                       0e6e79df-875e-4f24-8ae9-62dcc2148306   base
tensorflow_2.4-py3.7-horovod    1092590a-307d-563d-9b62-4eb7d64b3f22   base
pytorch_1.1-py3.6               10ac12d6-6b30-4ccd-8392-3e922c096a92   base
tensorflow_1.15-py3.6-ddl       111e41b3-de2d-5422-a4d6-bf776828c4b7   base
autoai-kb_rt22.2-py3.10        125b6d9a-5b1f-5e8d-972a-b251688ccf40   base
runtime-22.1-py3.9              12b83a17-24d8-5082-900f-0ab31fbfd3cb   base
scikit-learn_0.22-py3.6        154010fa-5b3b-4ac1-82af-4d5ee5abbc85   base
default_r3.6                    1b70aec3-ab34-4b87-8aa0-a4a3c8296a36   base
pytorch-onnx_1.3-py3.6         1bc6029a-cc97-56da-b8e0-39c3880dbbe7   base
kernel-spark3.3-r3.6            1c9e5454-f216-59dd-a20e-474a5cdf5988   base
pytorch-onnx_rt22.1-py3.9-edt   1d362186-7ad5-5b59-8b6c-9d0880bde37f   base
tensorflow_2.1-py3.6            1eb25b84-d6ed-5dde-b6a5-3fbd1665666   base
spark-mllib_3.2                 20047f72-0a98-58c7-9ff5-a77b012eb8f5   base
tensorflow_2.4-py3.8-horovod    217c16f6-178f-56bf-824a-b19f20564c49   base
runtime-22.1-py3.9-cuda        26215f05-08c3-5a41-a1b0-da66306ce658   base
do_py3.8                        295addb5-9ef9-547e-9bf4-92ae3563e720   base
autoai-ts_3.8-py3.8            2aa0c932-798f-5ae9-abd6-15e0c2402fb5   base
tensorflow_1.15-py3.6          2b73a275-7cbf-420b-a912-eae7f436e0bc   base
kernel-spark3.3-py3.9          2b7961e2-e3b1-5a8c-a491-482c8368839a   base
```

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Projects / arrythmia / cnn_arrythmia

spark-mllib_2.4_... 390d21f8-e58b-4fac-9c55-d7ceda621326 base
autoai-ts_rt22.2-py3.10 396b2e83-0953-5b86-9a55-7ce1628a406f base
xgboost_0.82-py3.6 39e31acd-5f30-41dc-ae44-60233c80306e base
pytorch-onnx_1.2-py3.6-edt 40589d0e-7019-4e28-8daa-fb03b6f4fe12 base
pytorch-onnx_rt22.2-py3.10 40e73f55-783a-5535-b3fa-0c8b94291431 base
default_r36py38 41c247d3-45f8-5a71-b065-8580229facf0 base
autoai-ts_rt22.1-py3.9 4269d26e-07ba-5d40-8f66-2d495b0c71f7 base
autoai-obm_3.0 42b92e18-d9ab-567f-988a-4240ba1ed5f7 base
pmm1-3.0_4.3 493bcb95-16f1-5bc5-bee8-81b8af80e9c7 base
spark-mllib_2.4-r_3.6 49403dff-92e9-4c87-a3d7-a42d0021c095 base
xgboost_0.90-py3.6 4ff8d6c2-1343-4c18-85e1-689c965304d3 base
pytorch-onnx_1.1-py3.6 50f95b2a-bc16-43bb-bc94-b0bed208c60b base
autoai-ts_3.9-py3.8 52c57136-80fa-572e-8728-a5e7cbb42cde base
spark-mllib_2.4-scala_2.11 55a70f99-7320-4be5-9fb9-9edb5a443af5 base
spark-mllib_3.0 5c1b0ca2-4977-5c2e-9439-ffd44ea8ffe9 base
autoai-obm_2.0 5c2e37fa-80b8-5e77-840f-d912469614ee base
spss-modeler_18.1 5c3cad7e-507f-4b2a-a9a3-ab53a21dee8b base
cuda-py3.8 5d3232bf-c86b-5df4-a2cd-7bb870a1cd4e base
runtime-22.2-py3.10-xc 5e8cddff-db4a-5a6a-b8aa-2d4af9864dab base
autoai-kb_3.1-py3.7 632d4b22-10aa-5180-88f0-f52dfb6444d7 base
-----
Note: Only first 50 records were displayed. To display more use 'limit' parameter.

In [26]: software_spec_uid = client.software_specifications.get_uid_by_name("tensorflow_rt22.1-py3.9")
software_spec_uid

Out[26]: 'acd9c798-6974-5d2f-a657-ce06e986df4d'

In [32]: model_details = client.repository.store_model(model='classification_cnn.tgz',meta_props={
client.repository.ModelMetaNames.NAME:"CNN_KEER",
client.repository.ModelMetaNames.TYPE:"tensorflow_2.7",
client.repository.ModelMetaNames.SOFTWARE_SPEC_UID:software_spec_uid})
model_id=client.repository.get_model_id(model_details)

In [33]: model_id

Out[33]: '4f59f727-c20e-49cb-8b5a-c880a69b0f32'
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Projects / arrythmia / cnn_arrythmia

In [35]: ls -l
total 6540
-rw-rw---- 1 wsuser wscommon 2054587 Nov 18 16:28 classification_cnn.tgz
drwxrwx--- 4 wsuser wscommon 4096 Nov 18 16:19 data/
-rw-rw---- 1 wsuser wscommon 2579272 Nov 18 16:28 ECG.h5
-rw-rw---- 1 wsuser wscommon 2054587 Nov 18 16:32 my_model.tar3.gz

In [36]: client.repository.download(model_id,'my_models.tar3.gz')
Successfully saved model content to file: 'my_models.tar3.gz'

Out[36]: '/home/wsuser/work/my_models.tar3.gz'

In [37]: ls -l
total 8548
-rw-rw---- 1 wsuser wscommon 2054587 Nov 18 16:28 classification_cnn.tgz
drwxrwx--- 4 wsuser wscommon 4096 Nov 18 16:19 data/
-rw-rw---- 1 wsuser wscommon 2579272 Nov 18 16:28 ECG.h5
-rw-rw---- 1 wsuser wscommon 2054587 Nov 18 16:41 my_models.tar3.gz
-rw-rw---- 1 wsuser wscommon 2054587 Nov 18 16:32 my_model.tar3.gz
```

TESTING ON IBM:

```
In [38]: from keras.models import load_model
from keras.preprocessing import image

In [40]: model=load_model('/home/wsuser/work/ECG.h5')

-rw-rw---- 1 wsuser wscommon 2054587 Nov 18 16:32 my_model.tar3.gz

In [46]: img=image.load_img('/home/wsuser/work/data/test/Left Bundle Branch Block/fig_5906.png', target_size=(64,64))
x=image.img_to_array(img)
x=np.expand_dims(x,axis=0)
pred=model.predict(x)
pred_classes=['Left bundle branch block', 'Normal', 'Premature atrial contraction', 'Premature ventricular contraction','Right bundle branch block','Ventricular fibrillation']
classes_x=np.argmax(pred)
print(pred)
print(pred_classes[classes_x])

[[1. 0. 0. 0. 0.]]
Left bundle branch block
```


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Space Details

Name

classification_cnn

Description

No description provided.

Space GUID

2597d5f1-b4d1-4484-a0ef-c0f3678fb...

Date created

Nov 18, 2022, 8:06 PM
by keerthana reddy R (You)

Last updated

Nov 18, 2022, 8:07 PM

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No tags are set to this space.

Danger Zone

Cloud Object Storage

Manage

Storage used

2.05 MB used

Name

Cloud Object Storage-vn

Bucket

2b8d348a-8918-4786-bd6c-25bdf6976514

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