Brain Tumor Detection From MRI Images With IBM Watson Studio

1. INTRODUCTION

1.1 Overview

Brain tumor identification is a really challenging task in the early stages of life. These days the issue of brain tumor automatic identification is of great interest. A tumor is the unusual growth of the tissues. A brain tumor is a number of unnecessary cells growing in the brain or central spinal canal. It is the unrestrained progress of cancer cells in any portion of the body.

Deep learning techniques can be used in order to detect the brain tumor of a patient using the MRI images of a patient's brain. In this application, we are helping the doctors and patients to classify the type of scan for the specific image given with the help of Neural Networks and store the patient's data.

1.2 Purpose

Brain tumor detection from MRI images is one of the most challenging task in today's modern Medical imaging research.Brain tumor detection really challenging task in early stages of life.These days issue of brain tumor automatic identification is of great interest.Tumor is the unusual growth of the tissues.

A brain tumor is a quantity of unnecessary cells growing in the brain or central spine canal.It is an unrestrained progress of cancer cells in any portion of the body.Inorder to detect the brain tumor of a patient ,MRI images of a patient's brain are considered.This application helps you detect the tumor and store the patient's data.

2. LITERATURE SURVEY

2.1 Existing problem

In this study, using MR images of the brain, we segmented brain tissues into normal tissues such as white matter, gray matter, cerebrospinal fluid (background), and tumor-infected tissues.

To classify the tumor stage by analyzing feature vectors and area of the tumor. In this study, we investigated texture based and histogram based features with a commonly recognized classifier for the classification of brain tumor from MR brain images. From the experimental results performed on the different images, it is clear that the analysis for the brain tumor detection is fast and accurate when compared with the manual detection performed by radiologists or clinical experts.

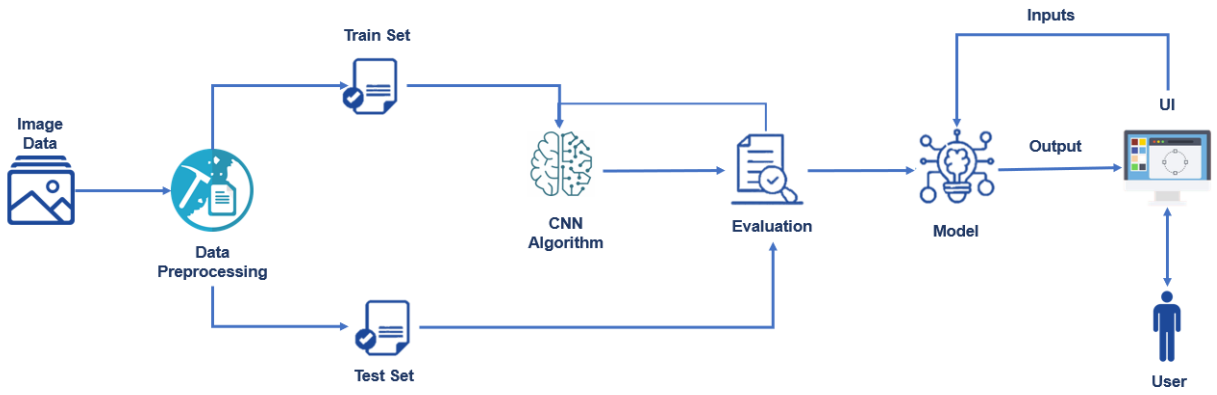
2.2 Proposed solution

Tumor is the unusual growth of the tissues.A brain tumor is a quantity of unnecessary cells growing in the brain or central spine canal.It is an unrestrained progress of cancer cells in any portion of the body.

Inorder to detect the brain tumor of a patient ,MRI images of a patient's brain are considered.This application helps you detect the tumor and store the patient's data.The result of the analysis is carried out whether the brain is normal one or diseased one by applying deep learning techniques.

3. THEORITICAL ANALYSIS

3.1 Block Diagram



3.2 Hardware / Software designing

Software Requirements:

- Anaconda Navigator
- Keras
- Flask

Hardware Requirements:

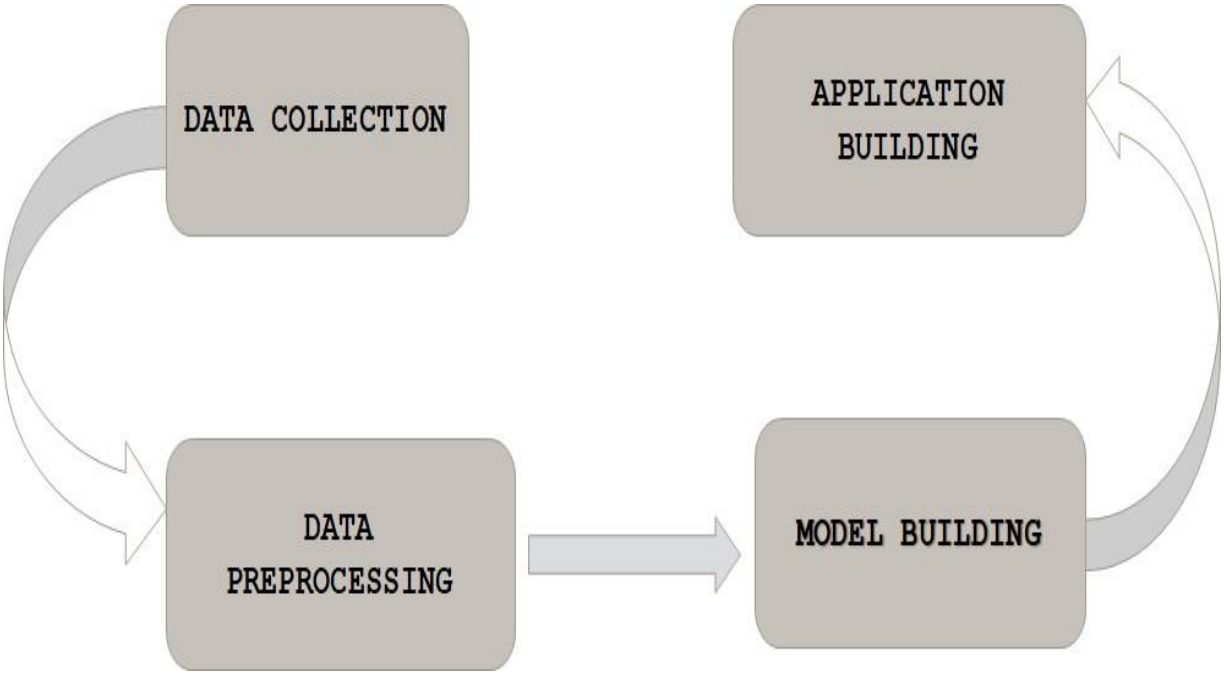
- Processor : Intel Core i3
- Hard Disk Space : Min 100 GB
- Ram : 4 GB
- Display : 14.1 “Color Monitor(LCD, CRT or LED)
- Clock Speed : 1.67 GHz

4. EXPERIMENTAL INVESTIGATIONS

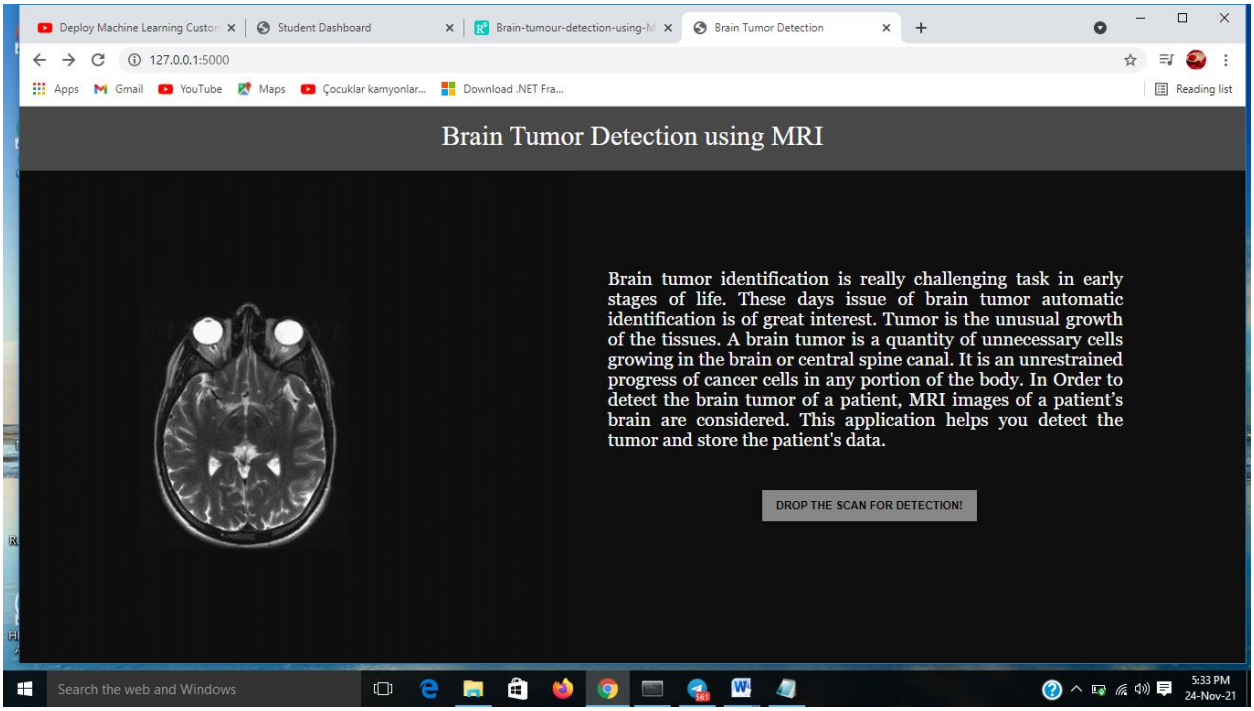
Our experimental results show that the proposed approach can aid in the accurate and timely detection of brain tumor along with the identification of its exact location. Thus, the proposed approach is significant for brain tumor detection from MR images.

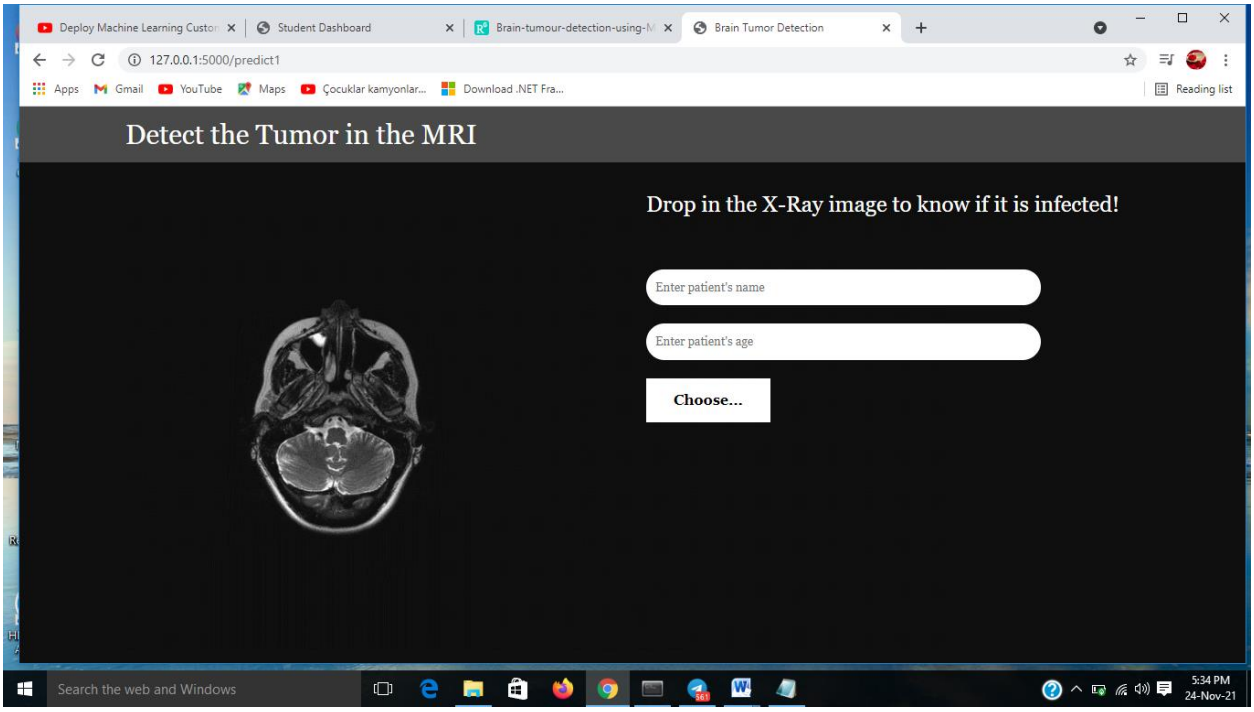
The experimental results achieved 96.51% accuracy demonstrating the effectiveness of the proposed technique for identifying normal and abnormal tissues from MR images. The result of the analysis is carried out whether the brain is normal one or diseased one by applying deep learning techniques.

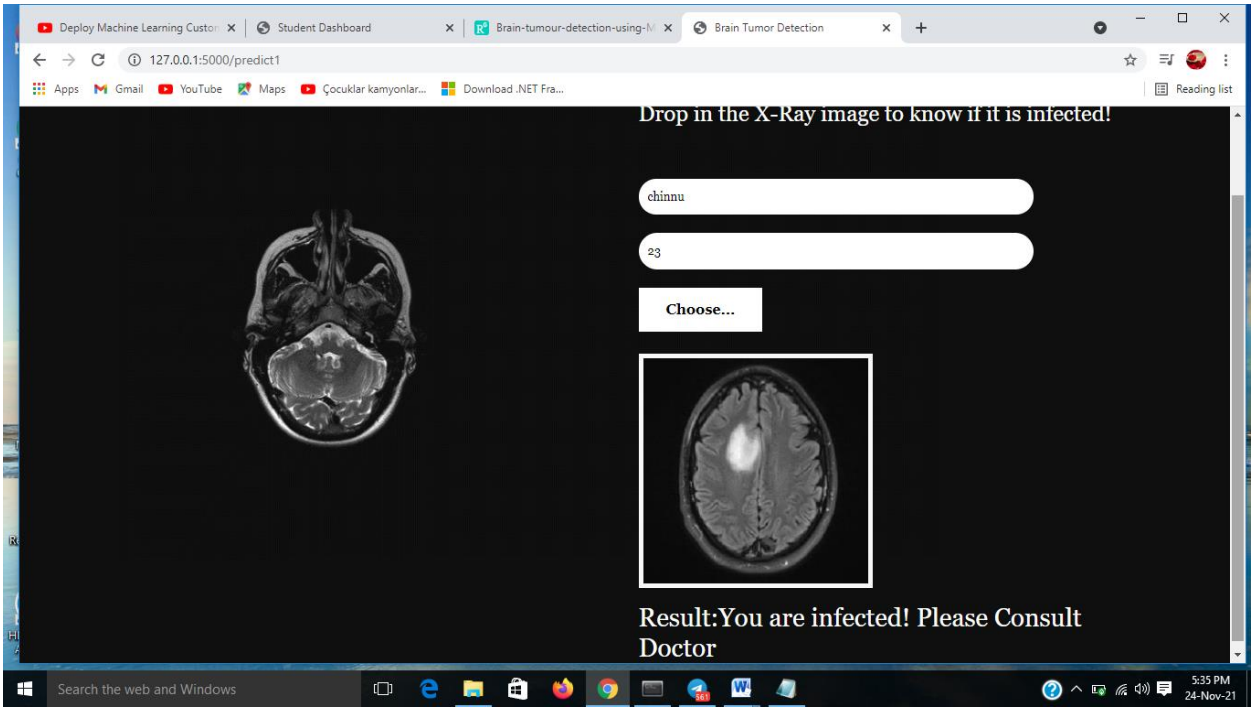
5. FLOWCHART


DATA COLLECTION
APPLICATION BUILDING
DATA PREPROCESSING
MODEL BUILDING

6. RESULT


Deploy Machine Learning Custor
Student Dashboard
Brain-tumour-detection-using-M
Brain Tumor Detection
127.0.0.1:5000
Apps
Gmail
YouTube
Maps
Çocuklar kamyonlar...
Download .NET Fra...
Reading list
Brain Tumor Detection using MRI
Brain tumor identification is really challenging task in early stages of life. These days issue of brain tumor automatic identification is of great interest. Tumor is the unusual growth of the tissues. A brain tumor is a quantity of unnecessary cells growing in the brain or central spine canal. It is an unrestrained progress of cancer cells in any portion of the body. In Order to detect the brain tumor of a patient, MRI images of a patient's brain are considered. This application helps you detect the tumor and store the patient's data.
DROP THE SCAN FOR DETECTION!
Search the web and Windows
5:33 PM
24-Nov-21


Deploy Machine Learning Custor
Student Dashboard
Brain-tumour-detection-using-M
Brain Tumor Detection
127.0.0.1:5000/predict1
Apps
Gmail
YouTube
Maps
Çocuklar kamyonlar...
Download .NET Fra...
Reading list
Detect the Tumor in the MRI
Drop in the X-Ray image to know if it is infected!
Enter patient's name
Enter patient's age
Choose...
Search the web and Windows
5:34 PM
24-Nov-21



7. ADVANTAGES & DISADVANTAGES

Advantages:

- MRI provide long information concerning the human delicate tissue,that help within the conclusion of brain tumor.
- The experimental results show high accuracy in detecting brain tumors with the help of datasets.
- Inorder to detect the brain tumor of a patient ,MRI images of a patient's brain are considered.This application helps you detect the tumor and store the patient's data.

Disadvantages:

- The Convolutional Neural Network (CNN) was implemented, which drives an overall accuracy of 91.3% and a recall of 88%, 81% and 99% in the detection of meningioma, glioma and pituitary tumor respectively.
- Deep learning architecture by leveraging 2D convolutional neural networks for the classification of the different types of brain tumor from MRI image slices.

8. APPLICATIONS

- The main aim of the application is tumor identification,this application is to provide proper treatment as soon as possible and protect the human life which is in danger.
- This application is helpful to doctors as well as patients.It is a user friendly application

9. CONCLUSION

The proposed algorithms for Brain Tumor Detection based on MRI Images will have higher accuracy and low error rates. The statistical analysis of the experimental results has indicated that the developed algorithm can segment brain MR images with good accuracy. We find ways to detect these tumors at faster rate to improve survival rates. The result of the analysis is carried out whether the brain is normal one or diseased one by applying deep learning techniques.

10. FUTURE SCOPE

Brain tumor identification is a really challenging task in the early stages of life. These days the issue of brain tumor automatic identification is of great interest. Deep learning techniques can be used in order to detect the brain tumor of a patient using the MRI images of a patient's brain.

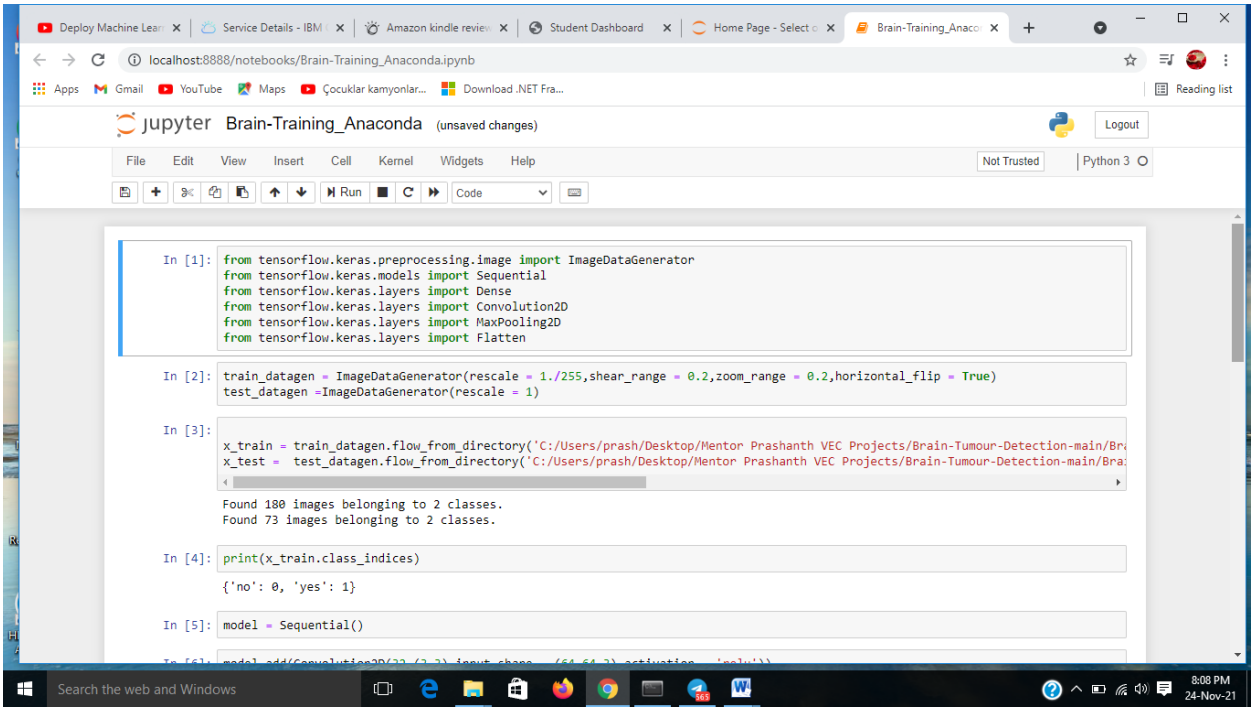
In this application, we are helping the doctors and patients to classify the type of scan for the specific image given with the help of Neural Networks and store the patient's data.This application is helpful to doctors as well as patients.It is a user friendly application

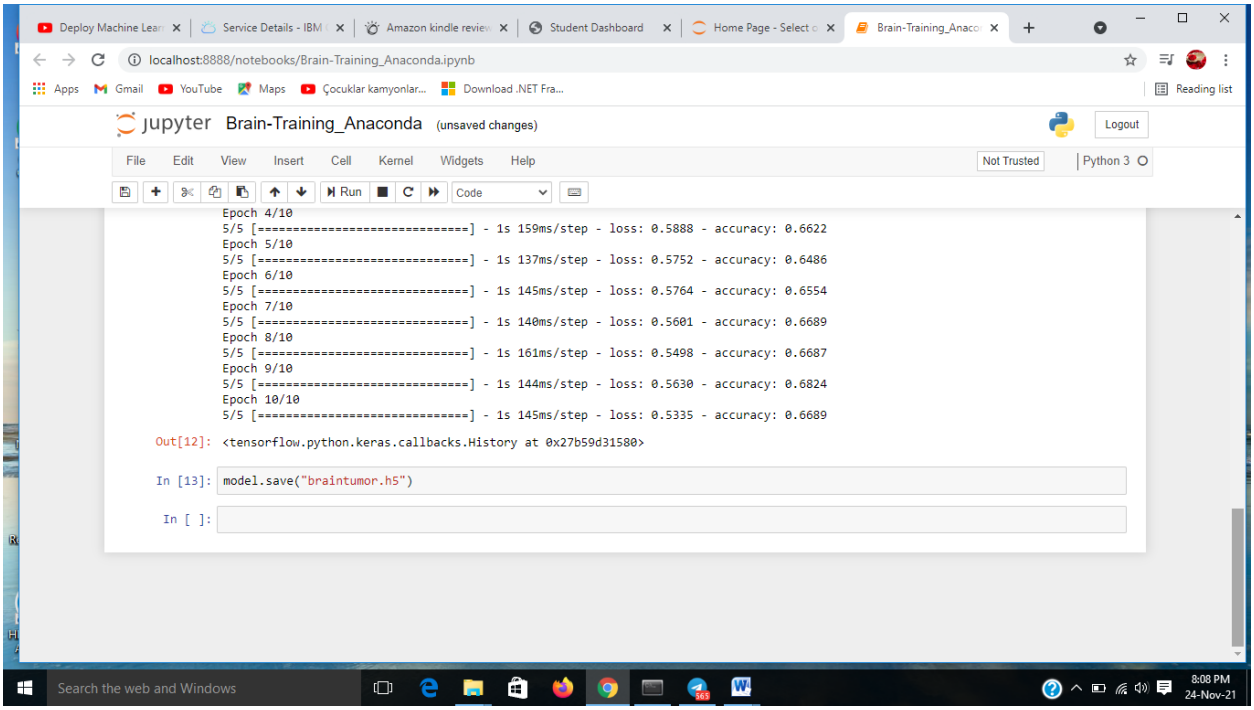
11. BIBILOGRAPHY

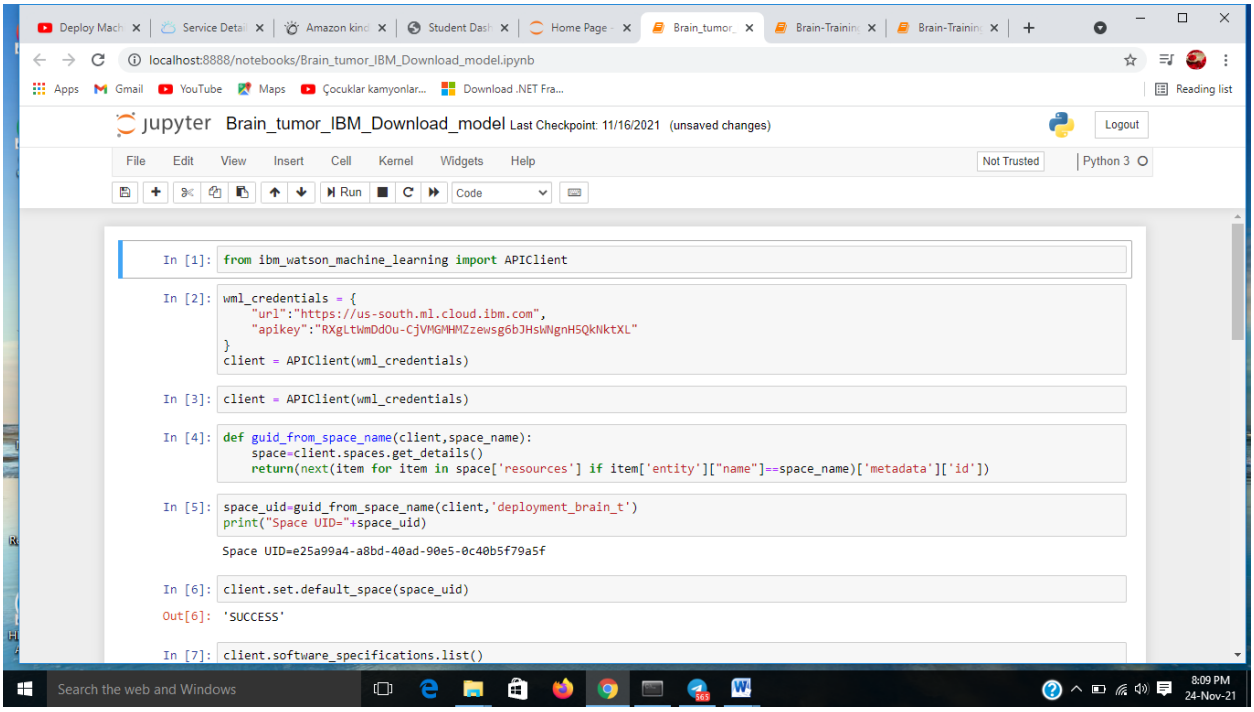
- https://en.wikipedia.org/wiki/Convolutional_neural_network
- https://www.geeksforgeeks.org/introduction-convolution-neural-network/
- https://en.wikipedia.org/wiki/Brain_tumor

APPENDIX

Source Code






localhost:8888/notebooks/Brain_tumor_IBM_Download_model.ipynb
jupyter Brain_tumor_IBM_Download_model Last Checkpoint: 11/16/2021 (unsaved changes)
Logout
File Edit View Insert Cell Kernel Widgets Help
Not Trusted
Python 3
Run
Code
In [1]: from ibm_watson_machine_learning import APIClient
In [2]: wml_credentials = {
"url":"https://us-south.ml.cloud.ibm.com",
"apikey":"RXgLtWmDdOu-CjVMGMHMZzewsg6bJHsWNgnH5QkNktXL"
}
client = APIClient(wml_credentials)
In [3]: client = APIClient(wml_credentials)
In [4]: 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'])
In [5]: space_uid=guid_from_space_name(client,'deployment_brain_t')
print("Space UID="+space_uid)
Space UID=e25a99a4-a8bd-40ad-90e5-0c40b5f79a5f
In [6]: client.set.default_space(space_uid)
Out[6]: 'SUCCESS'
In [7]: client.software_specifications.list()
Search the web and Windows
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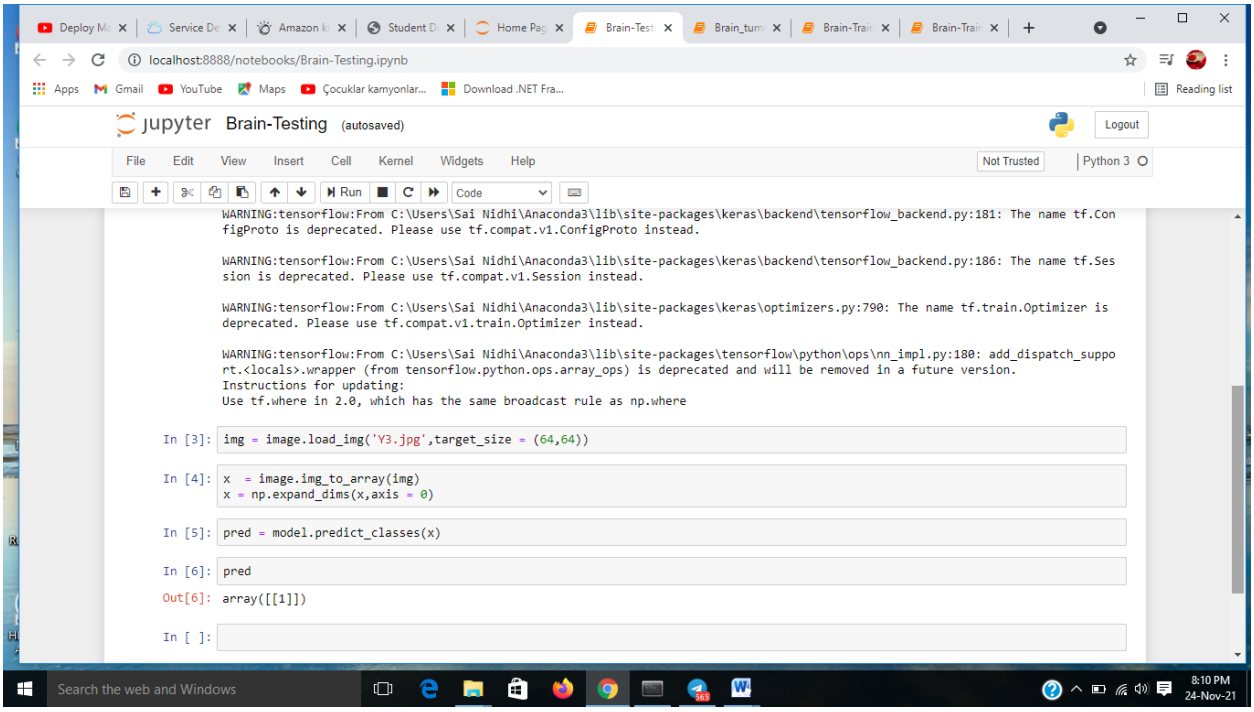
localhost:8888/notebooks/Brain-Testing.ipynb
jupyter Brain-Testing (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Not Trusted
Python 3
Run
Code
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\backend\tensorflow_backend.py:181: The name tf.ConfigProto is deprecated. Please use tf.compat.v1.ConfigProto instead.
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\backend\tensorflow_backend.py:186: The name tf.Session is deprecated. Please use tf.compat.v1.Session instead.
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\optimizers.py:790: The name tf.train.Optimizer is deprecated. Please use tf.compat.v1.train.Optimizer instead.
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\tensorflow\python\ops\nn_impl.py:180: add_dispatch_support.<locals>.wrapper (from tensorflow.python.ops.array_ops) is deprecated and will be removed in a future version.
Instructions for updating:
Use tf.where in 2.0, which has the same broadcast rule as np.where
In [3]: img = image.load_img('Y3.jpg',target_size = (64,64))
In [4]: x = image.img_to_array(img)
x = np.expand_dims(x,axis = 0)
In [5]: pred = model.predict_classes(x)
In [6]: pred
Out[6]: array([[1]])
In [ ]:
Search the web and Windows
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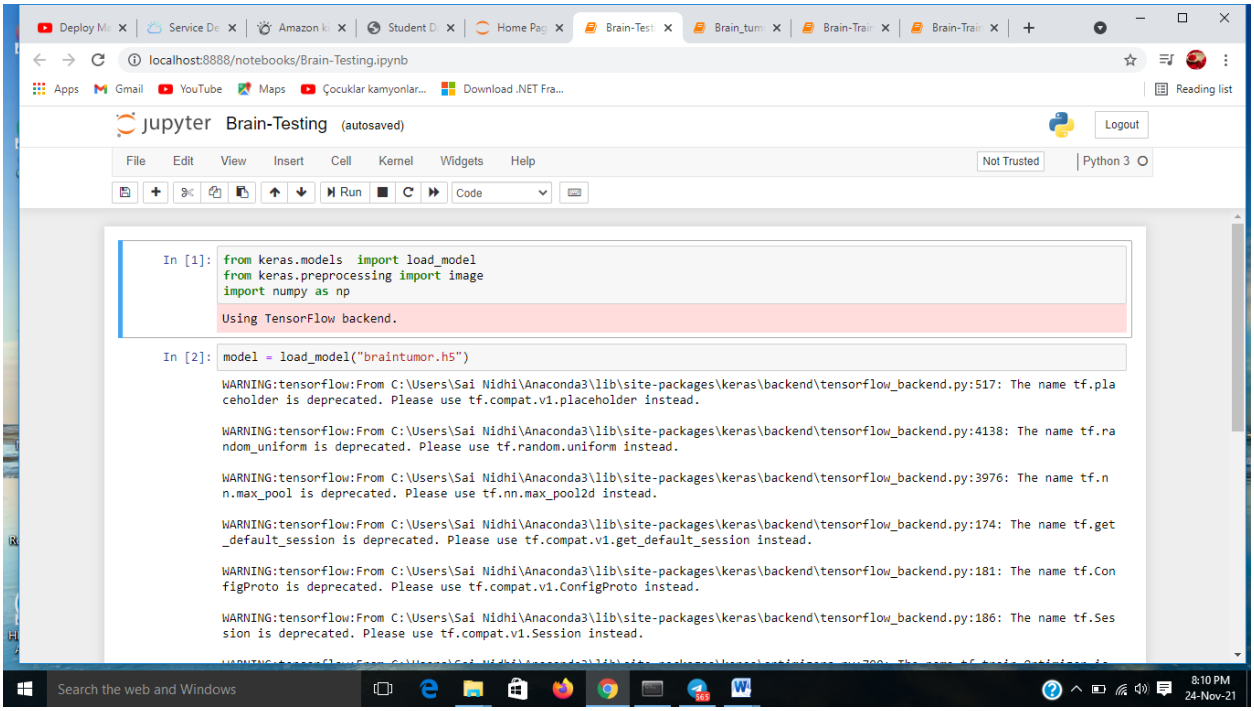
24-Nov-21


localhost:8888/notebooks/Brain-Testing.ipynb
jupyter Brain-Testing (autosaved)
Logout
File Edit View Insert Cell Kernel Widgets Help
Not Trusted
Python 3
Run
Code
In [1]:
from keras.models import load_model
from keras.preprocessing import image
import numpy as np
Using TensorFlow backend.
In [2]:
model = load_model("braintumor.h5")
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\backend\tensorflow_backend.py:517: The name tf.placeholder is deprecated. Please use tf.compat.v1.placeholder instead.
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\backend\tensorflow_backend.py:4138: The name tf.random_uniform is deprecated. Please use tf.random.uniform instead.
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\backend\tensorflow_backend.py:3976: The name tf.nn.max_pool is deprecated. Please use tf.nn.max_pool2d instead.
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\backend\tensorflow_backend.py:174: The name tf.get_default_session is deprecated. Please use tf.compat.v1.get_default_session instead.
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\backend\tensorflow_backend.py:181: The name tf.ConfigProto is deprecated. Please use tf.compat.v1.ConfigProto instead.
WARNING:tensorflow:From C:\Users\Sai Nidhi\Anaconda3\lib\site-packages\keras\backend\tensorflow_backend.py:186: The name tf.Session is deprecated. Please use tf.compat.v1.Session instead.
Search the web and Windows
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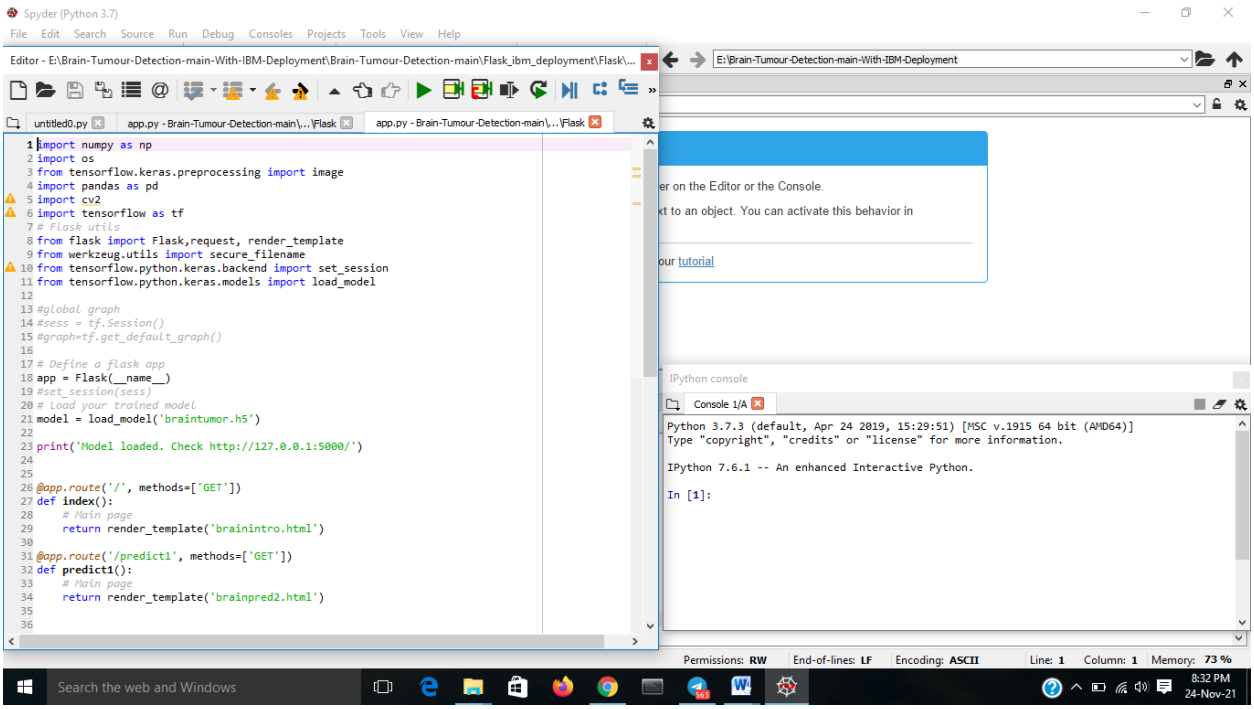
24-Nov-21


Spyder (Python 3.7)
File Edit Search Source Run Debug Consoles Projects Tools View Help
Editor - E:\Brain-Tumour-Detection-main-With-IBM-Deployment\Brain-Tumour-Detection-main\Flask_ibm_deployment\Flask\...
untitled0.py
app.py - Brain-Tumour-Detection-main\...\Flask
app.py - Brain-Tumour-Detection-main\...\Flask
import numpy as np
import os
from tensorflow.keras.preprocessing import image
import pandas as pd
import cv2
import tensorflow as tf
# Flask utils
from flask import Flask,request, render_template
from werkzeug.utils import secure_filename
from tensorflow.python.keras.backend import set_session
from tensorflow.python.keras.models import load_model
#global graph
#sess = tf.Session()
#graph=tf.get_default_graph()
# Define a flask app
app = Flask(__name__)
#set_session(sess)
# Load your trained model
model = load_model('braintumor.h5')
print('Model loaded. Check http://127.0.0.1:5000/')
@app.route('/', methods=['GET'])
def index():
# Main page
return render_template('brainintro.html')
@app.route('/predict1', methods=['GET'])
def predict1():
# Main page
return render_template('brainpred2.html')
E:\Brain-Tumour-Detection-main-With-IBM-Deployment
er on the Editor or the Console.
kt to an object. You can activate this behavior in
our tutorial
IPython console
Console 1/A
Python 3.7.3 (default, Apr 24 2019, 15:29:51) [MSC v.1915 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.
IPython 7.6.1 -- An enhanced Interactive Python.
In [1]:
Permissions: RW
End-of-lines: LF
Encoding: ASCII
Line: 1
Column: 1
Memory: 73 %
Search the web and Windows
8:32 PM
24-Nov-21