

REDHAAN REPORT

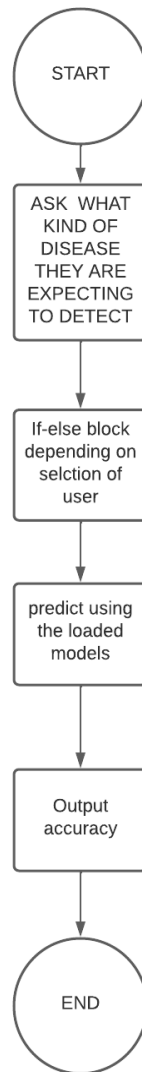
Introduction

This project is considered to be any persons personal virtual nurse, which monitors health issues diagnosed and faced by them, detects new diseases such as COVID-19, Skin cancer, heart disease, brain tumor, diabetes, breast cancer, prostate cancer for time being using the required values and images needed to analyze and detect. Whose UI would be like a chatbot, which will always stay active to monitor user's health, give them their health report minute to minute and provide feedback on regular basis, detect emergency and report to their family doctors or nearby hospitals.

Components Required

- OS either Windows or macOS
- Python 3.5–3.8
 - Python 3.8 support requires TensorFlow 2.2 or later.
- pip 19.0 or later (requires manylinux2010 support)
- Ubuntu 16.04 or later (64-bit)
- macOS 10.12.6 (Sierra) or later (64-bit) (*no GPU support*)
- Windows 7 or later (64-bit)
 - Microsoft Visual C++ Redistributable for Visual Studio 2015, 2017 and 2019
- Raspbian 9.0 or later
- GPU support requires a CUDA®-enabled card (*Ubuntu and Windows*)

Hardware Circuit Diagram or Software Design



Code

```
from keras.models import load_model
from keras_preprocessing import image
import numpy as np

print("Enter 1 for Skin Cancer Diagnosis \n"
      "Enter 2 for Brain Tumor Diagnosis \n"
      "Enter 3 for Diabetes Diagnosis \n")
```

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"Enter 4 for Heart Disease Diagnosis \n"
"Enter 5 for Breast Cancer Diagnosis \n"
"Enter 6 for COVID 19 Diagnosis")
selected = input("Enter choice(1/2/3/4/5/6): ")

if selected == '1':
    model = load_model('SCC.hdf5')
    test_image = image.load_img('<path to image>',
                                target_size=(32, 32))
    test_image = image.img_to_array(test_image)
    test_image = np.expand_dims(test_image, axis=0)
    prediction = model.predict(test_image)
    print(prediction)
    print(prediction.shape)
    if (prediction[0][0] == 1):
        print("Basal Cell Carcinoma, NON MELANOMA SKIN CANCER, POSITIVE")
    elif (prediction[0][1] == 1):
        print("Benign, NEGATIVE")
    elif (prediction[0][2] == 1):
        print("Melanoma, POSITIVE")
    else:
        print("Squamous cell carcinoma, NON MELANOMA SKIN CANCER, POSITIVE")
elif selected == '2':
    model = load_model('brain_tumor.hdf5')
    test_image = image.load_img('<path to image>',
                                target_size=(32, 32))
    test_image = image.img_to_array(test_image)
    test_image = np.expand_dims(test_image, axis=0)
    prediction = model.predict(test_image)
    print(prediction)
    print(prediction.shape)
    if (prediction[0][0] == 1):
        print("POSITIVE")
    else (prediction[0][1] == 1):
        print("NEGATIVE")

elif selected == '3':
    model = load_model('diabetes.hdf5')
    test_image = image.load_img('<path to image>',
                                target_size=(32, 32))
    test_image = image.img_to_array(test_image)
    test_image = np.expand_dims(test_image, axis=0)
    prediction = model.predict(test_image)
    print(prediction)

```

```

print(prediction.shape)
if (prediction[0][0] == 1):
    print("POSITIVE")
else (prediction[0][1] == 1):
    print("NEGATIVE")

elif selected == '4':
    model = load_model('heart_disease.sav')
    test_image = image.load_img('<path to image>',
                                target_size=(32, 32))
    test_image = image.img_to_array(test_image)
    test_image = np.expand_dims(test_image, axis=0)
    prediction = model.predict(test_image)
    print(prediction)
    print(prediction.shape)
    if (prediction[0][0] == 1):
        print("POSITIVE")
    else (prediction[0][1] == 1):
        print("NEGATIVE")

elif selected == '5':
    model = load_model('breast_cancer.hdf5')
    test_image = image.load_img('<path to image>',
                                target_size=(32, 32))
    test_image = image.img_to_array(test_image)
    test_image = np.expand_dims(test_image, axis=0)
    prediction = model.predict(test_image)
    print(prediction)
    print(prediction.shape)
    if (prediction[0][0] == 1):
        print("POSITIVE")
    else (prediction[0][1] == 1):
        print("NEGATIVE")

elif selected == '6':
    model = load_model('Covid19.hdf5')
    test_image = image.load_img('<path to image>',
                                target_size=(32, 32))
    test_image = image.img_to_array(test_image)
    test_image = np.expand_dims(test_image, axis=0)
    prediction = model.predict(test_image)
    print(prediction)
    print(prediction.shape)
    if (prediction[0][0] == 1):

```

```
        print("POSITIVE")
    else (prediction[0][1] == 1):
        print("NEGATIVE")

else:
    print("invalid response")
```

Working

This is a chatbot kind of application which will help users to detect various types of diseases including viruses, heart rate monitoring, and fitness tracking via synchronizing it with fitness bands which will help it to track and predicts diseases accurately.

Types of diseases we can detect now are:

- Skin cancer
- Brain tumor
- Lung cancer
- Breast cancer
- COVID 19
- Heart disease
- Diabetes

The main purpose of this project is to assist the user through his overall health, such as day to day monitoring of his health, indicating users when they are facing any issue such as over pulse, cancer depth level, analyzing symptoms of any issue, emergency helps such as contacting family doctor or nearby hospitals.

This can be an application which will be used by millions in smart phones. Due to current situations many people can't visit hospitals thus this application makes it easy for them to get clarity about any disease they are facing or confirmation about any unknown disease they are facing.

Practical Implementation & Output

- This can be practically used for below written applications:
 - Disease detection
 - Virus diagnose detection
 - Health monitoring
 - Emergency situation detection such as high risk, high pulse.. Etc.
 - Feedback system
 - Analysis of symptoms
 - Smart watch sync for fitness check
- Advantages are:
 - Free of cost
 - No need to travel to meet doctors
 - Detecting diseases before its late

- 24/7 analyzation of health
- A personal medical assistant
- Regular health care reminder
- Heart rate checks

Existing Competitors

- There exist some applications for different kinds of diseases such as skin cancer detection have an application, heart disease prediction is available in watches such as Apple watch... etc., but there isn't any application which include all kinds of diseases under one platform, so this was the motivating factor for us to reach out for the solution.

Conclusion

- Detecting many types of cancer and diseases is one of the core problems that is dealt in this project. In this project we are detecting Skin cancer, Predicting Heart disease, detecting lung cancer, breast cancer, brain tumor using Machine Learning with the help of programming language, Python, which helps us by providing required needs. Hence, it is achieved using datasets provided by top institutions and companies such as MIT, Kaggle...etc and Programming language. We achieved about 90% accuracy for the same as per the experiments conducted.

Applications & Future Scope

- Creating a smart phone application
- Adding wide range of diseases detection
- Patient-doctor consultation
- 24/7 monitoring