Brain Tumor Detection

v.1.0.0

(Beta)

Overview

In the medical field, Brain tumor is seen as a serious, abnormal growth of cells in or near the brain that can be either benign, which is non-cancerous or malignant, which is cancerous. There are many treatments an individual with such tumor can receive, such as radiation therapy, chemotherapy, therapeutic drug, etc. Brain tumor can be seen via Magnetic Resonance Imaging (MRI) scanned images. Human error is prone to occur in any industry, and because of such error in the medical field can cost a life. To detect and identify what constitutes a benign or malignant tumor without human intervention would be to build a robust deep learning model to help the medical practitioner properly classify a cancerous from noncancerous tumors using over 3000 MRI scan trained images and testing images to help better serve the model.

Purpose

The purpose for Brain Tumor Detection User Interface is to give the end-user the power to utilize a sophisticated Deep Learning model by uploading an image into the program, then submitting the image for the model to predict whether or not the MRI image submitted is in fact brain tumor, or not.

About

Application name: *Brain Tumor Detection*
Version: v.1.0.0 *(Beta)*
Release Date: TBD

Library Imports

In [22]:
```
import tkinter as tk
from tkinter import filedialog
from PIL import Image, ImageTk
import numpy as np
import tensorflow as tf
```

In [25]:
```
# Load your brain tumor detection model
model = tf.keras.models.load_model('model/brain_tumor_base_100_epochs_64_basics.h5')

# Create the Tkinter application window
window = tk.Tk()
window.title("Brain Tumor Detection v.1.0.0 (BETA)")
window.geometry("400x400")

# Function to open the file dialog and get the image file
def open_file():
    file_path = filedialog.askopenfilename(filetypes=[("Image files", "*.jpg;*.jpeg;*.png")])
    if file_path:
        # Display the selected image on the UI
        img = Image.open(file_path)
        img.thumbnail((300, 300))
        img = ImageTk.PhotoImage(img)
        panel.configure(image=img)
        panel.image = img

# Function to run the brain tumor detection model
def detect_tumor():
    if panel.image:
        # Preprocess the image
        img = panel.image
        img_pil = img._PhotoImage__photo.subsample(img.width() // 128, img.height() // 128)
        img_pil = ImageTk.getimage(img_pil)
        img_pil = np.array(img_pil) / 255.0
        img_pil = np.expand_dims(img_pil, axis=0)

        # Run the model prediction
        prediction = model.predict(img_pil)
        if prediction[0][0] > 0.5:
            result = "Brain tumor detected!"
        else:
            result = "No brain tumor detected."

        # Display the result on the UI
        result_label.configure(text=result)

# Create UI components
open_button = tk.Button(window, text="Open Image", command=open_file)
open_button.pack(pady=10)
```

```
panel = tk.Label(window)
panel.pack()

detect_button = tk.Button(window, text="Detect Tumor", command=detect_tumor)
detect_button.pack(pady=10)

result_label = tk.Label(window, text="")
result_label.pack()

# Start the Tkinter event loop
window.mainloop()
```

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