**Read Me File for Group 20’s AI Final Project**

Link to YouTube:

<https://youtu.be/s2zN39UqULY>

Link to deployed app:

<https://huggingface.co/spaces/NaaAyeleyAduAryee/Group20_AIFinal>

Link to keras model.

<https://drive.google.com/file/d/1-5FghdD6GWTY3k-jUgRz3s0sg5VgiM45/view?usp=drive_link>

## Overview

This project focuses on developing a machine-learning application for medical image classification, specifically targeting the identification of benign and malignant cells in histopathological images. The primary purpose of the project is to assist medical professionals in diagnosing cancerous conditions more efficiently and accurately. By leveraging a pre-trained deep learning model, the application can analyze an uploaded image and predict whether the cells present are benign or malignant.

The application features a user-friendly web interface that allows users to easily upload images and receive instant predictions. This functionality not only speeds up the diagnostic process but also provides a reliable second opinion for medical practitioners. The problem it solves is the need for rapid, accessible, and accurate diagnostic tools in oncology, which can significantly impact patient outcomes by enabling quicker treatment decisions.

## Features

* **Image Classification**: Predicts whether an input image is benign or malignant.
* **Image Preprocessing**: Converts images from BGR to RGB, resizes them, and normalizes pixel values.
* **Model Integration**: Utilizes a trained deep-learning model to classify images.
* **Web Interface**: User-friendly web interface built using [Hugging Face](https://huggingface.co/) Spaces.

## Prerequisites

Before you begin, ensure you have met the following requirements:

* **Python 3.7+**: Make sure Python is installed. You can download it from [python.org](https://www.python.org/downloads/).
* **pip**: Python's package installer.
* **Virtual Environment (optional but recommended)**: To manage dependencies separately.

## Installation

1. **Clone the Repository**:
2. **Set Up a Virtual Environment** (optional but recommended):
3. **Install Dependencies**:

## Downloading and Saving the Model

1. **Download the Model**: Download the pre-trained model file from the provided link or Hugging Face Model Hub. Ensure you have the correct file format and version compatible with your application.
2. **Loading the Model**: Ensure that your script correctly loads the model:

## Building the App with Hugging Face

1. **Hugging Face Integration**:
   * Create a new repository on [Hugging Face](https://huggingface.co/).
   * Push your application code and model to the Hugging Face repository.
   * Ensure your app uses the Streamlit library for the web interface, as they are compatible with Hugging Face Spaces.
2. **Configuring the App**:
   * Include a configuration file (e.g., app.py) that sets up the web interface and integrates with the model.
3. **Deploy the App**:
   * Push the repository to Hugging Face.
   * Go to your Hugging Face repository and launch the app. The app will be hosted on the Hugging Face Spaces platform.

## Running the Application

1. **On Hugging Face**:
   * Navigate to your Hugging Face Space URL.
   * The app should be live and accessible through the provided link.