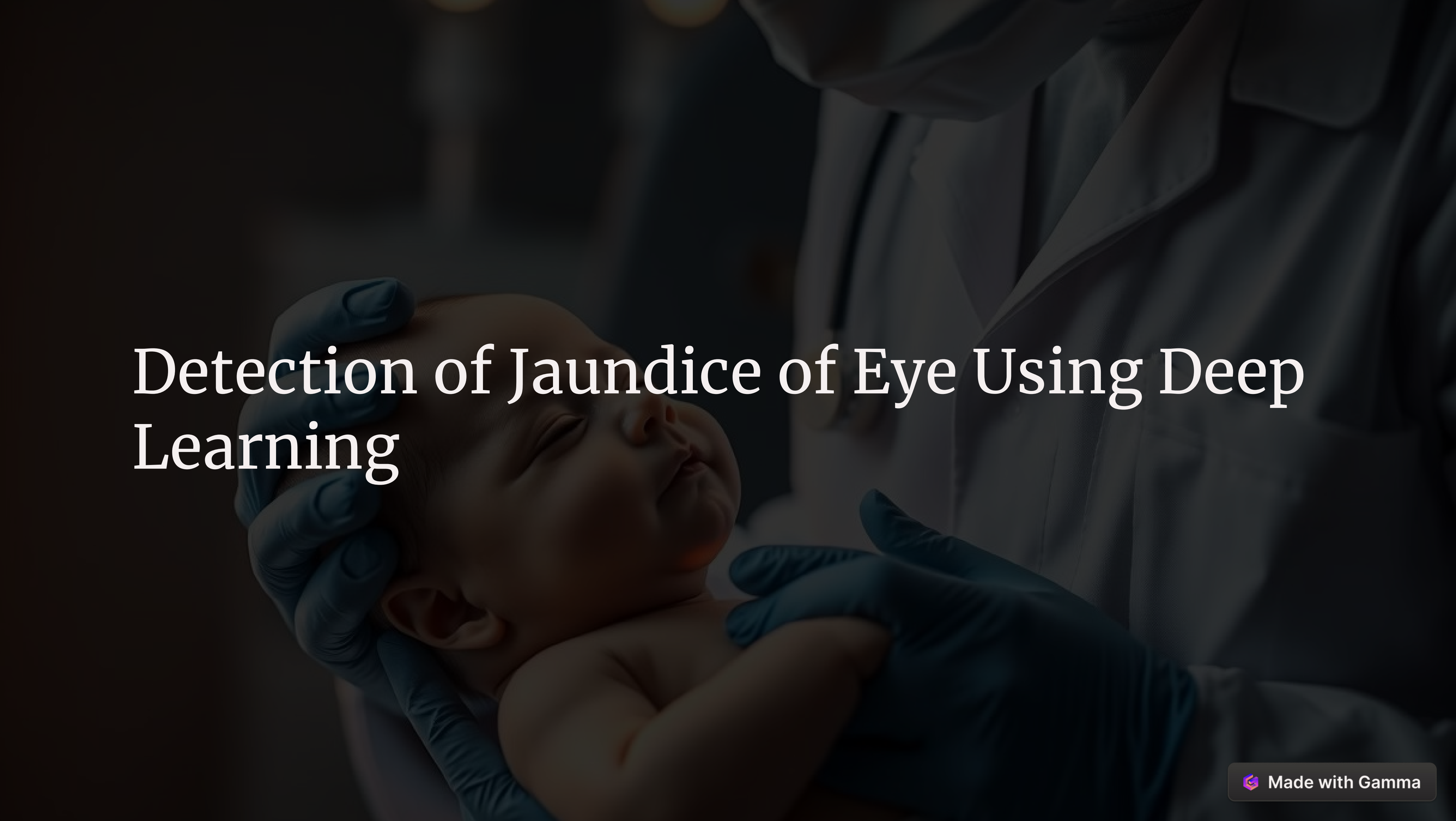

Detection of Jaundice of Eye Using Deep Learning

Introduction to Jaundice of Eye Project

This project addresses the issue of jaundice detection using deep learning techniques, specifically through the analysis of medical images. Jaundice is a condition characterized by the yellowing of eyes, caused by the high level of bilirubin in the bloodstream.

Overview of Project

This project is focused on developing a model for detecting jaundice in the eyes using deep learning techniques. The primary goal is to create a model that can analyze medical images of the eyes and identify whether a person has jaundice or not. The project uses a convolutional neural network (CNN) or ResNet model to train on labeled images of jaundiced and normal eyes, and the system is enhanced with image processing techniques to improve jaundice detection.

Running Code

To run your code, you can use an Integrated Development Environment (IDE) like **Spyder**, **VS Code**, or even Jupyter Notebook.

Libraries Used:
Torch: PyTorch for deep learning tasks.
Torchvision: Provides models and image transformations.
Matplotlib: Used for plotting graphs.
Sklearn.metrics: For evaluating the model using confusion matrix.
Seaborn: For better visualization of confusion matrix.
Tkinter: For building the GUI application.
PIL: For image processing (resizing, enhancing)

To install them

‘’pip install torch torchvision matplotlib scikit-learn seaborn tk pillow’’ on CMD

When prompted, type your choice for the model by model_choice = "CNN" or "ResNet"

Download the Dataset: https://www.kaggle.com/datasets/puspendrakumar77/jaundiced-and-normal-eyes

Enhancement Dataset

(Yousef Sobhy eldenary)

This function enhances the visibility of jaundice in images by adjusting the color balance. It modifies the hue to emphasize yellow tones, increases the saturation and brightness, and enhances the overall contrast and color for better visualization of jaundice symptoms.

Dataset Preprocessing and loading

(Ahmed saad anwar manaa)

- Images are preprocessed with transformations, including resizing, random rotation, horizontal flipping.
- The images are also normalized for better model performance.
- Loader and splitting data

CNN Architecture or ResNet Model

(Ibrahiem Hany Mohamed Hosny Mekhemr)

- CNN model consists of **5 convolutional layers** followed by **3 fully connected layers**.
- The convolutional layers extract features from the image, and the fully connected layers make the final classification.
- Dropout is used to prevent overfitting during training.
- **ResNet18** is a deep Convolutional Neural Network designed with 18 layers, primarily consisting of convolutional layers, batch normalization, and residual blocks.

Training Model

(Ibrahiem Hany Mohamed Hosny Mekhemr)

The `train_model` function trains a neural network model using a dataset over multiple iterations (epochs). It updates the model's weights to minimize the loss and improves its accuracy on the training data.

Evaluation

(Yousef Sobhy eldenary)

This function evaluates the trained model on test data by disabling gradient computations, making predictions, and comparing them to true labels. It calculates the overall accuracy and returns both the true labels and predictions for further analysis.

Visualization

(Sheref Mohamed Zakaria Mohamed)

- Visualizes the training loss and accuracy per epoch using line plots. Subplots are created for loss and accuracy, showing their progression across epochs for better understanding of model performance.
- Generates and visualizes a confusion matrix to evaluate the model's predictions against true labels.
- Displays a few test images alongside their true labels and predicted classes.
- Converts tensors into images for visualization, normalizes the image values, and arranges them in a grid format for clear comparison.

GUI

(Mohamed sameh Abdelkhaleq)

code creates a **Graphical User Interface (GUI)** using **Tkinter** for predicting jaundice or normal eyes from uploaded images.

Tkinter components include:

- A button for uploading images.
- A label for displaying the selected image.
- A label for showing the prediction result.

Documentation

(Ahmed samy hussin Mehles)

Preparing documentation and Readme and ensuring all code is well-commented.