National University
of computer and emerging sciences

Technical Details

Digital Image Processing

Semester Project

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Chosen Deep Learning Architecture:

- Convolutional Neural Network (CNN) is chosen for this task. CNNs are widely used for image classification tasks due to their ability to automatically learn spatial hierarchies of features from input images.

Network Architecture Details:

The CNN architecture consists of:

- Two fully connected hidden layers, each with 1024 units and using the hyperbolic tangent (tanh) activation function.
- An output layer with a single unit and a sigmoid activation function for binary classification.
- The input dimension of the network is determined by the flattened size of the input images (256x256 pixels).
- The network uses binary cross-entropy loss for training.

Training Process Details:

Data augmentation: No explicit data augmentation techniques are applied in this implementation. Data augmentation techniques like rotation, scaling, and flipping could be beneficial to improve model generalization, especially with limited data.

Optimizer Choice: Stochastic Gradient Descent (SGD) optimizer is used with default parameters.

Post-processing Techniques:

The code applies post-processing techniques, including Gaussian blur for smoothing and thresholding, to refine the segmentation results obtained from the neural network model trained to detect glaucoma. Smoothing reduces noise and creates smoother transitions between pixel intensities, while thresholding separates regions of interest from the background by binarizing the images