HOG-based Face Detection Implementation

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1 Implementation Summary

This report presents a Histogram of Oriented Gradients (HOG) based face detection system implementation. The system uses template matching with HOG features to detect faces in target images.

HOG Feature Extraction	**Face Recognition Pipeline**
• Gradient computation using differential filters • 6-bin orientation histograms in 8×8 pixel cells • L2 normalization of 2×2 cell blocks	• Sliding window template matching • Normalized Cross Correlation (NCC) for similarity measurement • NCC threshold: **0.48** (experimentally determined) • Non-Maximum Suppression (IoU threshold: 0.5)

2 Results

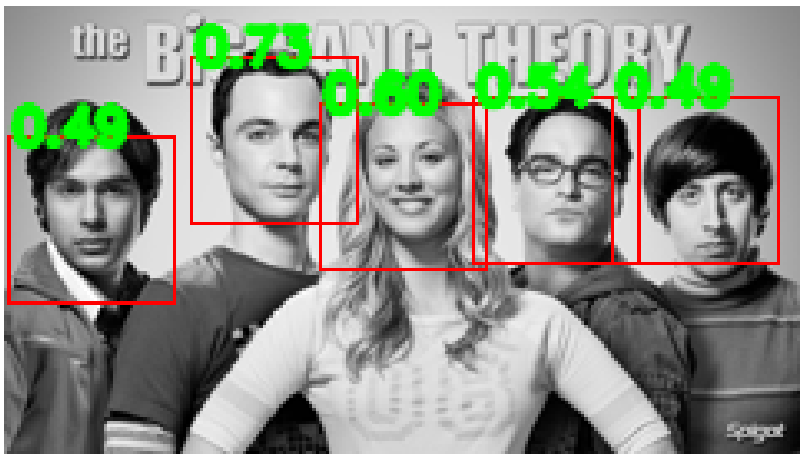

Figure 1: Face detection results showing bounding boxes with NCC scores