

**School of Engineering and Applied Science (SEAS),
Ahmedabad University**

ECE501: Digital Image Processing

Group Name: Humans.exe

Project 2: Person Retrieval

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I. Introduction

- **Goal:** Person Retrieval - finding all images of the same person in a given photo database.
- **Common Method:** Normally done with Machine Learning / Deep Learning.
- **Our Approach:** Use only Classical Digital Image Processing (DIP) Techniques.
- **Our Database:** 20 photos → 4 persons x 5 photos each.

II. Objectives

This week aims at working on the accuracy and reliability of the person retrieval system by eliminating the current errors and narrowing down the performance of the system. We are primarily targeting to find the underlying cause of the existing problems in the results of the system and make relevant corrections. Another goal is to increase the accuracy of the retrieval process through the optimization of the feature extraction, similarity measurement, preprocessing methodologies. We will aim to make more consistent and accurate results through the systematic testing and parameter optimization so that the system will be more stable and reliable to later stages of development and testing.

III. What has been done so far (Progress)

The objectives of the project in person retrieval were to create a person retrieval mechanism in images without applying machine learning or deep learning algorithms. First, we have tried such classical algorithms like Linear SVC, K-Nearest Neighbors, and Decision Tree classifiers through Kaggle datasets. Various feature extraction techniques such as color histogram, edge detection and texture analysis were experimented to identify people differently. Another activity we engaged in was data preprocessing which involved resizing, conversion of the data into grayscale and normalization to enhance consistency of features.

Although these efforts were made, there was no significant improvement in accuracy and reliability. The models were also poor at retrieving because of the differences in lighting, pose, and background. We experimented with increasing the size of the dataset, parameters and weighted feature fusion to improve performances although the gains were minimal. This step allowed us to get acquainted with the shortcomings of conventional methods and the significance of sound feature representation of persons to retrieve them. In general, the amount of work we have already accomplished has been associated with testing various algorithms, optimizing preprocessing to improve performance, and analyzing it to organize a more robust foundation of the project further improvement.

IV. What is planned for next week

- Continue with the work on finding the current flaws of the system and fixing them in order to work more freely and provide better outcomes.
- Make the feature extraction and matching process more accurate in order to increase the precision of person retrieval.
- Idle further testing and parameter manipulations that tend to enhance the overall accuracy and stability of the system.

References

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