



SMART CROWD ANALYZER

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Abstract

This proposed project is modeled upon a people counter, namely, **"Smart Crowd Analyzer"**, which is a bidirectional crowd analysis device based on a smart networked video-camera that analyses crowd features using Artificial intelligence and Deep Learning algorithms. The project is based on prior research with the addition of embedded features such as group detection, age estimation, gender determination, and regular customer detection. After analysis of the physical traits of people, an analytical report is generated, that provides retailers with deep insights analysis and tracking in retail operations, and comprehends efficient marketing schemes that optimize sales, and business performance.

Objectives

- Detect the gender of people visiting.
- Detect the age of people with respect to classified age groups.
- Detect number of people visiting a shop.
- Generate real time stats and analysis report.
- Deploy a online platform to use these algorithms.

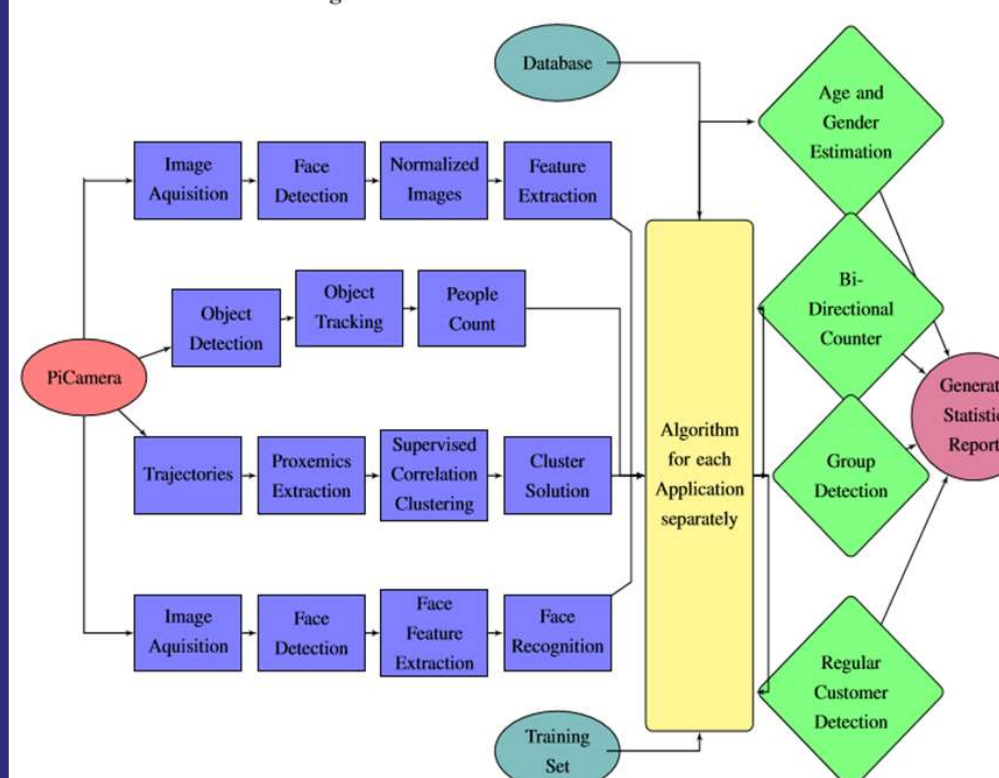
Dataset

The dataset applied on our model for facial recognition is taken from UTKFace dataset, which has a large variety of images of different ages and genders. The model is trained on the dataset, preprocessed and then evaluated. As a result we achieve an accuracy of 80% for age estimation and 90% for gender detection.

Methodology

We have used a simple architecture for image capturing and abstraction . The input is passed through a series of openCV algorithms for people counting and facial recognition. HoG (History of Orientated Gaussians) and SVM (Support Vector Machines) detector is used to compute tracking of objects. Whereas for facial recognition, Webers Local texture Descriptor has been used for age and gender recognition, demonstrating near-perfect performance on the Labeled Faces in the Wild (LFW) benchmark. LBP descriptor variations and a dropout-SVM classifier will be used to increase the accuracy for age estimation and for gender determination, a combination of LBP features with an AdaBoost classifier is used. For Regular Customer Detection, the same model of people counting has been used, with an additional feature of comparing the captured input with a previously stored database.

Block Diagram



Results and Discussion



SUMMARY

We present a people counting system that extracts physical traits from a live stream and generates an analytical report that will benefit retailers by providing them with deep insights into retail operations and result in effective marketing initiatives that would increment their sales. A comprehensive understanding of customer behavior and interaction within stores will benefit in stock management, public space designing, task distribution, and will ensure a proper working environment.

Acknowledgement

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Reference

H. Bischof B. Wachmann, W. Kropatsch. "Evaluation of People Counting Systems", January 2001.