

Abstract

People counting of an area can be useful for many things, including security, promotional strategy, visitor counting, people counting in queue, etc. Based on this background, automatic and real-time people counting system using surveillance camera become an important Computer Vision problem to be developed.

People counting can be applied using a virtual line called Line of Interest (LOI). People recorded in the video will be represented as blob(s). When a blob cross the LOI, the system will count the number of people in the blob. Ellipse Detection is a method to estimate the number of people in a blob. Ellipse Detection Method can be used when there are any occlusion or not.

First, the system performs a background subtraction using Gaussian Mixture Model (GMM) to separate foreground from its background. The results of GMM are white colored foreground, and black colored background. Then it will find the contours to group connected foregrounds together as blobs. An analysis then performed for each blob to estimate the number of people in it using Ellipse Detection. When a blob cross the LOI, the number of people estimated in that blob will be counted.

From the result of tests that have been conducted, system could reach 100% accuracy when there's no occlusion happening. If there are occlusions, the accuracy is ranged from 50% to 100%.

Keywords: People Counting, Ellipse Detection, GMM, contours, LOI