Digital image processing project 2

——Fire detection

Introduction

Fire detection in video surveillance concerned with identifying or finding a fire region from a video surveillance of visible or infrared camera. Fire detection techniques have been explored by many researchers and video-based image processing approach is becoming more and more interesting. This approach is mainly based on the properties of fire flame. The flame is an important characteristic of flaming combustion and plays an important role in fire detection.

Goals

The goals of this project are as follows:

1. Understand background(foreground) modeling, frame differences and object detection (you may also need the knowledge of image matching).
2. Get practice with image segmentation based on color.
3. Utilize motion information and propose fire detection schemes in visible or infrared videos captured by moving cameras.

Description

Fire1.mp4 and fire2.mp4 are video files captured by moving cameras. There are some non-fire regions (lights, signs, bricks, helmets, etc.) that are very similar to the fire regions in color. For fire detection in video *gasstove_visible.avi*, you can use information in video *gasstove_infrared.avi* which is taken by an infrared camera at the same time with the visible camera from which *gasstove_visible.avi* is obtained. All videos suffer from some noise.

Question

1. Detect all the fire regions in the given videos.

You will detect all the fire regions on the video frames. Draw a bounding box on each of the fire region detected. The bounding box should be as tight as possible. Try to achieve high detection rate and low false alarm rate.

You may carry out the detection frame by frame, or do that only when

necessary if you employ object(multi-object) tracking technique.

Submitting your work

1. Make a PPT file, and present your work in the class (Nov 29). Each group has 5~8 minutes.
2. Submit the following materials to your Teaching Assistants before 23:59,Dec 2:

A. Source code (*.m/*.c/*.cpp/*.py, …)

B. Output results (in mp4 or avi format)

C. Project report (in word or pdf format)

List the names and student IDs of all team members on the first page of the report. It's recommended that you send a single zipped file named as YourGroupID+ProjectX (e.g. Group5+Project1.rar/ Group5+Project1.zip)

3. Your presentation and project report should be in English. Try your best!

All team members share the same project score! Teamwork! Teamwork! Teamwork!