**TCV 3151 – Computer Vision**

**Lab 9**

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**Section 1: Theory**

The following questions will serve as a guide in confirming your understanding in the computer vision field. Answer all of the questions below.

1. Name three possibilities that cause relative motion between the scene and the camera.

**Answer:**

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| --- |
| 1. The camera stay still, scene moving 2. Camera moving, scene static 3. Camera moving, scene moving |

1. What is the advantage of using accumulative difference pictures as compared to difference images? Describe how accumulative difference pictures achieve this advantage?

**Answer:**

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| Accumulative difference pictures are good because they can deal with small motion and slow-moving objects. They can achieve this by analyzing changes over a sequence of frames. |

1. Briefly explain the time-varying edge detection technique.

**Answer:**

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| The motion of a moving object with discernible static edges will affect the different images and thus provide a response in both static and dynamic processing steps. The combination of this information is used to extract moving edges. |

1. What are the two general approaches used to calculate image flow?

**Answer:**

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| Feature-based approach and Direct method approach |

**Section 2: Practical**

*Problem: Intruder Detection for Surveillance System*

You have to create an intruder detection program for a surveillance system. Assume that a static surveillance camera is calibrated at a highly secure room to monitor the environment there. You program should monitor the video captured by the camera and issues alert when an intruder passes by the area. Given a video sequence, *video.avi*, containing the video stream recorded by the camera. Your program should remain idle if there is no object in the video sequence (Figure 1). However, if an intruder by passes the area, your program should immediately issues alert by displaying an alert message on the screen (Figure 2). At the same time, you program should also sounds an alarm using the wav file contained in *somethingwrong.wav*.

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| --- | --- |
| background | live |
| Figure 1 | Figure 2 |