**Name: VEN THON**

**ID: e20191250**

**Group: I5-GIC-C**

Assignment Discussion11

1. What is edge detection?

* Edge detection is an image processing technique for finding the boundaries of objects within images.

1. Why do we need edge detection?

Because we want to:

* Detect an object in an image
* Example: a robot that wants to play soccer
* Do measures of an image
* Example: objects verification in a factory
* Extract information from an image
* Example: intensity, types of images
* Compress image data
* Example: decreasing size of image

1. What are primitives of edge detection?

Primitives of edge detection are:

* **Edges:** typically occur on the boundary between two different regions in a n image.
* They are important features for analyzing images.
* **Region of interest (ROI):** is a selected subset of samples within a dataset

identified for a particular purpose.

* The ROI defines the borders of an object under consideration.
* **Point of interest (POI) or corners:** is a specific point in an image that may find useful or interesting.
* POI is selected from the general background in a field of view.
* P**atterns:** are a repetition of specific visual elements.
* Natural patterns include spirals, waves, and so on.

1. Explain the edge detection algorithm?

Algorithms for edge detection contain 4 steps:

* **Filtering:** is used to improve the performance of an edge detector with respect to noise. However, there is a balance between edge strength and noise reduction. More filtering to reduce noise results in a loss of edge strength.
* **Enhancement:** emphasizes pixels where there is a significant change in local intensity values and is usually performed by computing the gradient magnitude.
* **Detection:** determine which points are edge points. Frequently, thresholding provides the criterion used for detection.
* **Localization:** estimate the location of the edge with subpixel resolution if required for the application. The edge orientation can also be estimated.

1. How to enhance first filter result?

Enhancing first filter result:

* In order to enhance the result, we will compose:
* A vertical edge detector
* difference between (x, y) and (x–1, y)
* Icv(x, y) = I(x, y) – I(x–1, y)
* An horizontal edge detector
* difference between (x, y) and (x, y–1)
* Ich(x, y) = I(x, y) – I(x, y–1)
* A magnitude
* Ic(x, y) = sqrt(Icv (x, y)^2 + Ich(x, y)^2 )
* In brief, we separate result of edge detection into two:
* Vertical result
* Horizontal result