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Topic: Assignment of Computer Vision and Image Processing
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Title: Assignment Based on the Edge Detection

- What is edge detection?

Edge detection is an image processing technique for finding the boundaries of objects within images. It works by detecting discontinuities in brightness. Edge detection is used for image segmentation and data extraction in areas such as image processing, computer vision, and machine vision.

- Difference between Sobel filtering and Canny filtering?

Sobel detection refers to computing the gradient magnitude of an image using 3x3 filters. Where "gradient magnitude" is, for each a pixel, a number giving the absolute value of the rate of change in light intensity in the direction that maximizes this number. Canny edge detection goes a bit further by removing speckle noise with a low pass filter first, then applying a Sobel filter, and then doing non-maximum suppression to pick out the best pixel for edges when there are multiple possibilities in a local neighborhood. That's a simplification, but basically it’s smarter than just applying a threshold

to a Sobel filter. But it is still fairly low level image processing, and based on a small neighborhood around the pixel for which the “edge value” is computed.

"Edge detection" could refer to either of the above, or to many modern edge detection algorithms that are much more sophisticated than either of the above. For example there are edge detectors that have some success at finding edges between two textured regions while ignoring the edges in the textures themselves. There are edge detectors that are more global in scope in that they try to find edges between regions of homogeneous color or texture.

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