**Research for implementation in MATLAB**

* **Algorithm shortlisted and used:**

First part of image comparison includes detecting edges of the image for this canny edge detection algorithm is used.

### Canny Edge Detection Algorithm

The Canny algorithm is flexible to different environments. Its parameters allow it to be tailored to detection of edges of differing characteristics depending on the specific requirements.

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The Process of Canny edge detection algorithm can be broken down to 4 different steps:

**1.) Smooth image with a Gaussian**

Since edge detection results are easily affected image noise, so Gaussian filter is applied to smooth the image in order to remove noise to prevent false detection.

**2). Find the intensity gradients of the image**

An edge in an image may points in different directions, so the Canny algorithm uses filters to detect horizontal, vertical and diagonal edges.

**3). Applying non-maximum suppression**

Thin edges by applying non-maxima suppression to the gradient magnitude to get rid of spurious response to edge detection

**4). Hysteresis threshold**

Next is to filter out edge pixel with weak and strong gradient value. If an edge pixel’s gradient value is higher than the high threshold value, it is marked as a strong edge pixel. If an edge pixel’s gradient value is smaller than the high threshold value and larger than the low threshold value, it is marked as a weak edge pixel. Weak edges are discarded in the end.