

Improvements to Edge Detection for use in Facial Recognition Software

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1.2. Doel

The edge detection currently used in the repo ignore insignificant edges, such as those found in the wrinkles in clothes caused by low contrast edges, the objective is to only show an edge when there is a significant change in intensity.

The original implementation of the edge detection appears to only be a convolution of the image with a 9x9 version of the the positive laplacian matrix. Preprocessing besides a conversion to grayscale, and scaling.

The goal of this Study/Implementation is to see what steps are needed to improve upon a base laplacian operator, and if these steps are worth the (possible) reduction in runtime efficiency.

TODO more bg info pictures mb? title page

```
0, 0, 0, 1, 1, 1, 0, 0, 0,
0, 0, 0, 1, 1, 1, 0, 0, 0,
0, 0, 0, 1, 1, 1, 0, 0, 0,
1, 1, 1, -4, -4, -4, 1, 1, 1,
1, 1, 1, -4, -4, -4, 1, 1, 1,
1, 1, 1, -4, -4, -4, 1, 1, 1,
0, 0, 0, 1, 1, 1, 0, 0, 0,
0, 0, 0, 1, 1, 1, 0, 0, 0,
0, 0, 0, 1, 1, 1, 0, 0, 0);
```

1.3. Methoden

As Stated before the original implementation of the edge detection appears to only be a convolution of the image with a 9x9 version of the the positive laplacian matrix. The only preprocessing done is resizing to a set resolution and a conversion to grayscale. Initial research and lectures suggest that applying a blur effect will reduce noise and disregard less significant edges.

The positive laplacian matrix is not the only convolution that can be used to detect edges; Besides the obvious Negative laplacian matrix, Horizontal and Vertical Sobel convolutions can also be used for this purpose.

Different Laplacian Matrix aswell?

TODO examples.

1.4. Keuze

Je geeft een onderbouwing over waarom een bepaalde methode is gekozen, en/of waarom bepaalde settings zijn gebruikt.

TODO

1.5. Implementatie

Je geeft aan hoe deze keuze is geïmplementeerd in de code

TODO

1.6. Evaluatie

Je geeft aan welke experimenten er gedaan zullen worden om de implementatie te testen en te 'bewijzen' dat de implementatie daadwerkelijk correct werkt. Dit geeft direct informatie over de meetrappen die er zullen worden gemaakt.

TODO

sources for edge detection:

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.402.1860&rep=rep1&type=pdf>

https://en.wikipedia.org/wiki/Edge_detection#Approaches

https://en.wikipedia.org/wiki/Sobel_operator

https://en.wikipedia.org/wiki/Canny_edge_detector

<https://www.sciencedirect.com/science/article/pii/S0167865507003467>