

# HW5 : Image line detector

tanukiHough, KAIST EE, Master course, 20203344, 신현호, 010-5136-6003

## Abstract

Welcome to brief description of tanukiHough, HW5 program designed by Hyeonho shin.

This program is written in Python, with Numpy and OpenCV. And you can execute in terminal with the path of image to transform.

Source code repository : <https://github.com/hyeonhoshin/tanukiHough> (If code is not working, uses this)

## Verified Environment

- Python 3.7.9
- Numpy 1.19.2
- OpenCV-python 3.4.2

## How to use

```
Windows PowerShell
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새로운 크로스 플랫폼 PowerShell 사용 https://aka.ms/pscore6

개인 및 시스템 프로필을 로드하는 데 911ms가 걸렸습니다.
(base) PS C:\Users\user> conda activate opencv
(opencv) PS C:\Users\user> cd .\Documents\tanukiHough\
(opencv) PS C:\Users\user\Documents\tanukiHough> python hough.py -i stuff.jpg
```

1. In terminal, enter the folder generated from what I uploaded.
2. Type "python hough.py -i [input\_file.name]". If you don't declare the input path option, it uses 'stuff.jpg'
3. See the generated image. It even would save the image as 'output.png' in the same folder.

## Design

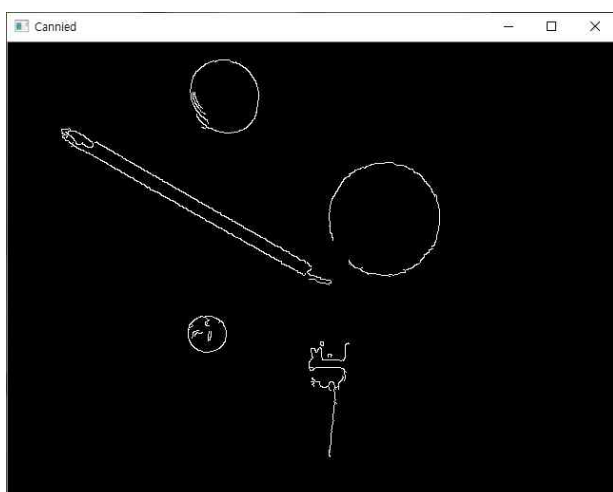


그림 2 Standard Canny Detector's output

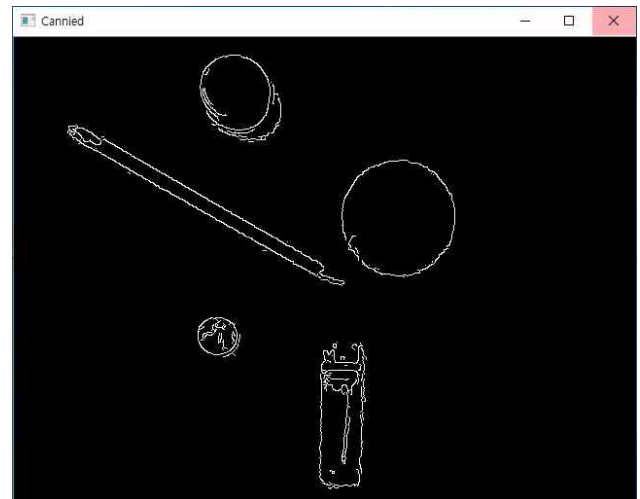


그림 3 tanukiHough's Canny detector's output

I found the optimal lines by trying Canny edge detectors optimization and a lot of parameters combinations. And I can get the result same as the below image.

Sadly, for recognizing horizontal lines I tried lower threshold, with observing the combinations of minLineLength and maxLinGap parameters. But in the almost cases, it makes hough detector generating noise lines also.

## Result



그림 4 Original 'stuff.jpg' image

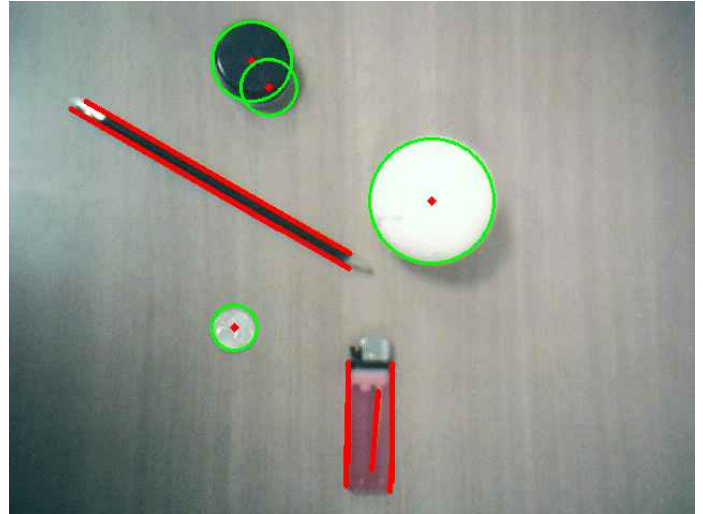


그림 5 Detected lines from 'stuff.jpg'

Red lines are the result of `HoughLinesP()`. And Green lines are the result of `HoughCircles()`.

We can observe the circles and lines are successfully detected from the given 'stuff.jpg' image. Also we can confirm the detector only extracts important lines.

## References

[1] gramman “허프변환” 2006. , [Accessed: 25-Oct-2020].

<https://opencv-python.readthedocs.io/en/latest/doc/25.imageHoughLineTransform/imageHoughLineTransform.html>