Winter 2019-20 CPP Robotics Club By: Joe Rubio

Mini-Project #1 – Sobel Slide Images

Overview In this project, you will be designing a Python script that uses the image

processing functions of OpenCV to efficiently filter image files for use as slide backgrounds

for our club's general meeting slides. Objectives for this project will be released first and

over the course of the next couple weeks, I will release additional hints and resources that

will help you to complete the project. Our projects are all about learning, so try developing

the project on your own first before using the hints. OpenCV can be tricky, so do not feel

bad if you are not able to develop this script on your first try. You will also be contending

with the syntax of Python which should be new for most of you.

I. Design the filter: By now you have probably seen the custom slide backgrounds we

use on our general meeting slides. These are filtered using the sobel function provided

by OpenCV. This function has different parameters that can be modified to improve

the result of your filtering. Play around with the filtering until you can produce the

best results for your images. You may also try other filters to see what they produce.

II. Procure test images: Certain images work better with the sobel filter. Overly elaborate

images may not produce a clean background. While you test your filters, see which

images produce the best results. Cull your images from the internet or other sources

to use with your filter once you discover which ones are most appropriate for this

task
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III. Design the Python script: Once your filter is designed and your test images are

compiled, you will develop an efficient Python script that can filter your images in

bulk. The best overall script will replace the one I currently use to produce the slide

backgrounds. The design is up to you. My script uses for loops and clever naming of

the image files to accomplish this task, but you may develop another method if you

prefer. I will release my script at a later time for your reference but try developing the

code on your own
first.

IV. Submit code and filtered images: Your work on this project is a service to your club!

Submit your code and filtered images and you may see your work on display in

the

future, during our general meetings. I currently produce these images myself so your

assistance with this task will be much appreciated.

V. Hints and resources: I will first direct you to the scripts provided to you for the

OpenCV workshop. These will give you a head start in developing your filter and

accompanying script. Later I will provide some image examples to show the effects of

the image filter. You will see examples of poorly filtered images, images that do not

work well with the filter, and properly filtered images. These will guide you towards

developing the best filter. Lastly, I will release the script I currently use to produce the

background images. This is a rough script. If you have trouble developing this project,

you can experiment with my script and clean it up to produce a useful result and

hopefully learn a thing or two about Python and OpenCV.

This is a practice project. It will help you to better understand Python and OpenCV.

These skills will prove useful to you in helping to develop our club's primary projects.

Proficiency in these skills will position you to lead a project team or in the very least,

provide a significant contribution to your project team next semester. Learning these

techniques is more important that producing a useful script. Focus on gaining

understanding so that you can help to guide your fellow club members to success. I will be

supporting you through the process. If you get stuck or confused, please message me on

slack. You may ask questions in the general channel so that others may learn from them as

well. Good luck friends! And thank you for supporting your club. We work hard to provide

you with benefits through our club and there is nothing more rewarding than seeing our

members reaping these
benefits.