

ECOR 1042
Project Report

Photo Filter Application

Submitted by

TEAM T028

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1 CONTENTS

The Problem Statement:	2
The Project Goal	3
The Project Design:	3
The Project Process	4
Team Contributions	4
References	4

2 THE PROBLEM STATEMENT:

Camera's have existed in various capacities for over 100 years, and have remained an important part of society ever since [1]. Nowadays, it is very common for people to have an HD camera in their pocket in the form of a smartphone. With the digitalization of photos, anyone is able to change how their pictures look right before their eyes with the use of filters. These can be used to create a fun new look, or enhance certain aspects of an image, to completely transform its aesthetic.

Digital photos store three core colours that make up the image, and with filters these can easily be altered. For example, with this technique, we can reduce the amount of blue in the image which creates a warmer picture.

Colour filters, a filter that modifies the colours of an image, work by altering the RGB values of every pixel in an image. By setting two of the three RGB values to 0, the image will only contain one colour (see Figure 1 for example).



Figure 1: Example of the application of a Red RGB filter to a photo, removing green and blue components.

3 THE PROJECT GOAL

The goal of this project is to create a photo-editing program that allows the user to choose an image from their computer, apply various filters to it, draw curves over it, and view the new image [2].

4 THE PROJECT DESIGN:

The program will contain multiple steps:

- 1) The user will be prompted to enter commands through a text-based user interface. The commands available to the user will allow them to either load an image through a file explorer pop-up, apply one of a variety of filters to an already loaded image, or draw a curve on the loaded image.
- 2) After an image is loaded, the program will present the user with the same load and filter commands. Each filter command will pass a copy of the loaded image into a different filter function.
- 3) The filter commands will modify each pixel of the loaded image in a different way depending on the filter selected.
- 4) If the user chooses the draw curve command, they will be asked to input 3 coefficients for the equation of a curve in the form of $ax^2 + bx + c$ (with a, b and c being the user inputs) [3].
- 5) The filtered image will then be displayed to the user in a pop-up box and a curve will be drawn on top if the curve command was chosen.

5 THE PROJECT PROCESS

The project will be handled by a team of four people. All group members will be working remotely, so communication will be done through online services.

The application development will be split into separate parts which will be developed in series. These parts will be split into multiple smaller tasks which will be divided among team members and developed in parallel. At the end of the development of each part, team members will come together to integrate their individual tasks into a final product.

The plan thus far is to evenly distribute the amount of work over the course of the project, while taking into account each of the four group member's strengths and weaknesses. This cooperation is to be continued throughout the project so that the best work possible will be delivered while still keeping the workload evenly distributed among group members.

All code will include test functions that will create and filter sample images to verify the correct functioning of each filter.

6 TEAM CONTRIBUTIONS

Each member wrote a possible answer for each part, with the final answer being the sum of everyone's best ideas.

The Problem Statement: K.N. Bundhoo, J. Smolkin-Lerner, K. Simos, K. Myinia

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The Project Process: K.N. Bundhoo, J. Smolkin-Lerner, K. Simos, K. Myinia

7 REFERENCES

[1] A. Davlin. (2011). *History of Cameras: Illustrated Timeline* [Online]. Available <https://photodoto.com/camera-history-timeline/>.

[2] Carleton University. (2021). *Milestone 1* [Online]. Available https://culearn.carleton.ca/moodle/pluginfile.php/4431170/mod_resource/content/15/ECOR1042-project-milestone1.pdf

[3] Carleton University. (2021). *Milestone 2* [Online]. Available https://culearn.carleton.ca/moodle/pluginfile.php/4431181/mod_resource/content/18/ECOR1042-project-milestone2.pdf