Perspective Transformation in OpenCV

Sarthak Behera - 2018CS10384
Anil Kumar Uchadiya - 2017CS10327

February 2021

Introduction

Computer Vision problems often involve perspective transformation as cameras may not have the correct angle needed for image identification. Here, we consider a 2D transformation. Perspective transformation usually involves mapping input points to destination points. This mapping or operation involves matrices where one extra coordinate is introduced for the ease of operation. 2D points are represented in 3 coordinates and a matrix connects the input and destination coordinates. Various 2D transformations include translation, rotation, scaling, affine. Here we consider a generalized transformation and use OpenCV functions to determine the homography matrix by taking in the input and destination points.

How to run

The Makefile provides commands for simple execution. Running $make$ compiles the main cpp file

Listing 1: bash version

```
make
```

Now we can run the executable along with the image file given as an argument with **-i** option

Listing 2: bash version

```
./homography -i image.jpg
```

We use the Boost argument parser so any wrong command-line arguments are notified. Running the executable, we obtain the image in new window and mouse-click for input points starting from the upper-left and going in the anti-clockwise direction. The cropped perspective transform image is saved in the same directory. There is also another $makeremove$ to remove output files. The argument parser handles invalid commands and the $-h$ option prints the help-menu for the executable.