

Virtual drawing board controlled by Hand-Motion-Detection
and Finger-Tracking (CVSP Lab)

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Chapter 1

Problem description

The aim of this project is to develop a prototype for a virtual drawing board on an Android device. The user interface mainly consists of the drawing board (which is in fact the camera image) and three rectangles in the left corner of the camera image for picking a color. The input of the user is determined by gesture recognition based on finger and hand motion detection.

1.1 Gestures

The initial state is shown in 1.1. From this state the user is enabled to select a color (red, green or blue) from the left corner of the screen. This select operation is shown in 1.2.



Figure 1.1: Initial state



Figure 1.2: Select Operation (works like a usual left mouse click)

After selecting a color, the user is able to draw simple lines or objects (like the pencil function in other drawing programs), as demonstrated in 1.3.

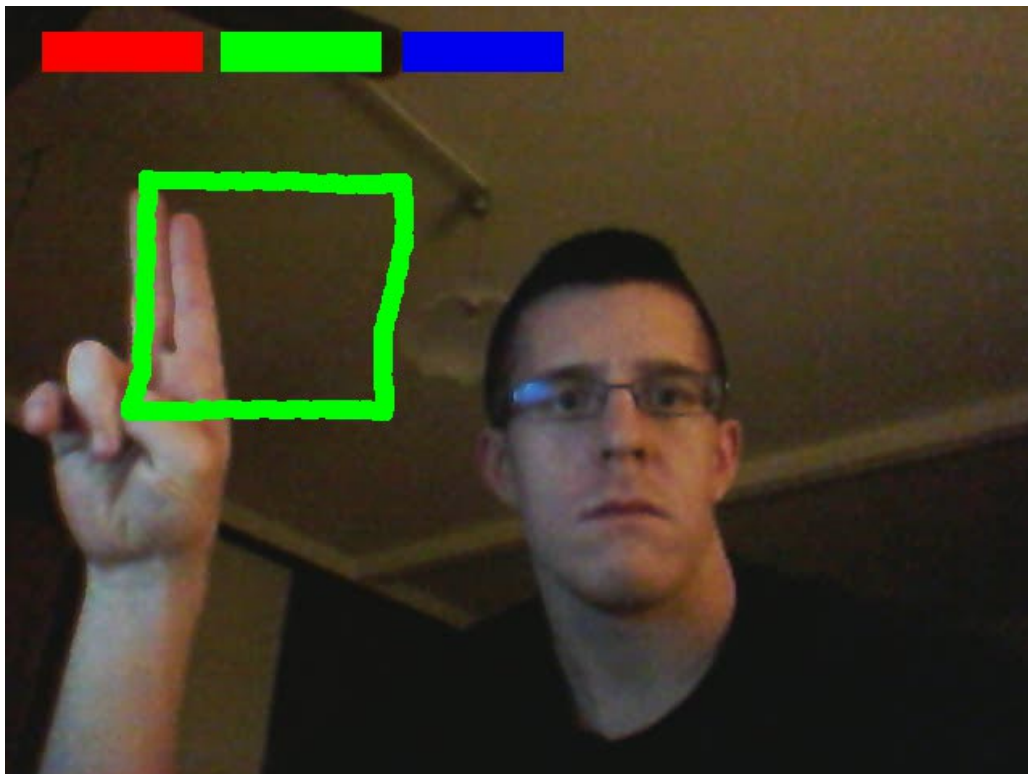


Figure 1.3: Drawing of a simple rectangle

Additionally the user interface also offers erasing and selecting functionalities. In 1.4 an object is selected and can be moved somewhere else on the drawing board. 1.5 demonstrates the gesture for erasing an area.

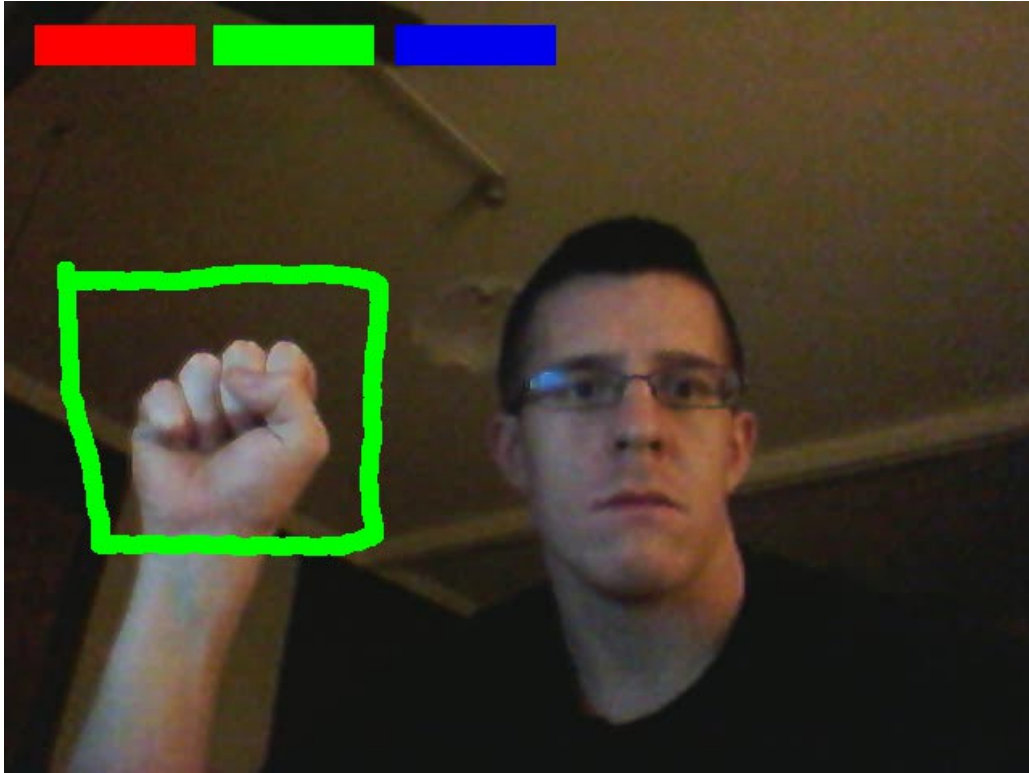


Figure 1.4: Moving an object

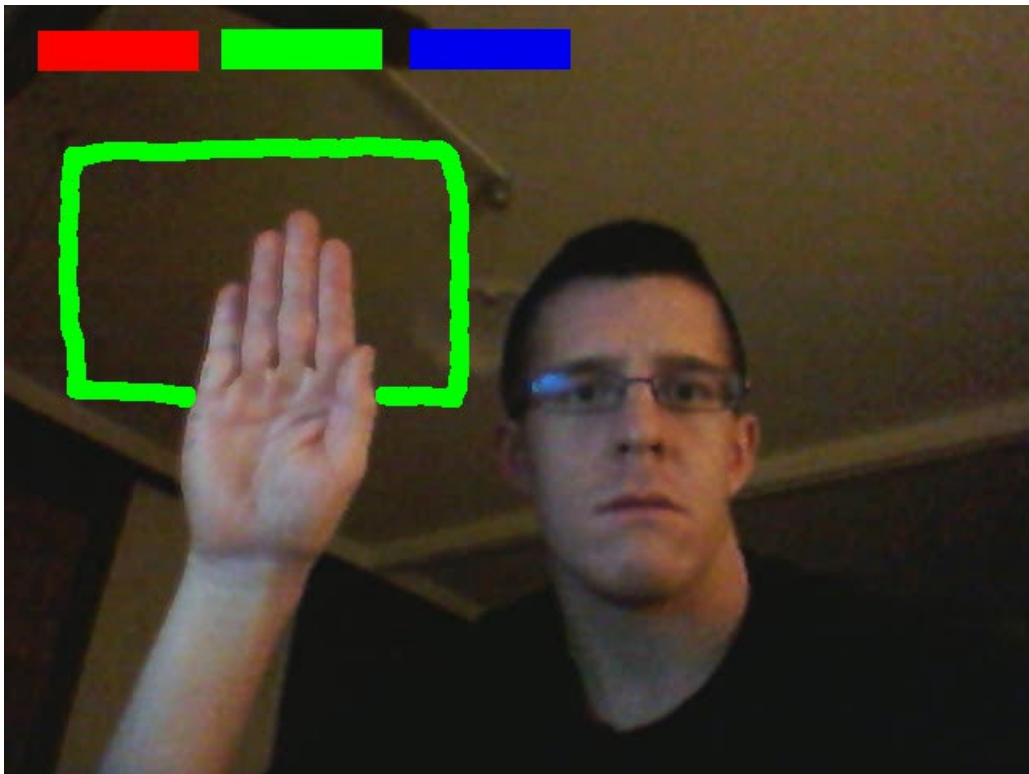


Figure 1.5: Erasing an area

1.2 Implementation

The target device for this project is the Google Nexus 7 tablet (Android 4.1). For the implementation the OpenCV library will be used.

Bibliography

- [1] R. Szeliski, *Computer Vision: Algorithms and Applications*. Springer, 2010.