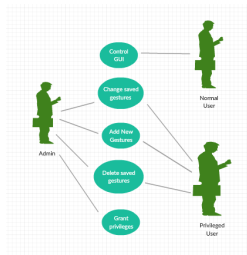


Project title

CS18L1 Project

regno rollno name

B. Tech Computer Science & Engineering



Department of Computer Engineering

Model Engineering College

Thrikkakara, Kochi 682021

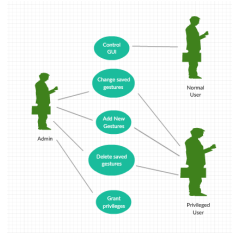
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C E R T I F I C A T E

This is to certify that, this report titled ***Project title*** is a bonafide record of the work done by
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Eighth Semester B. Tech. Computer Science & Engineering

students, for the course work in **CS18L1 Project**, which is the second part of the two semester project work, under our guidance and supervision, in partial fulfillment of the requirements for the award of the degree, B. Tech. Computer Science & Engineering of **Cochin University of Science & Technology**.

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name

Abstract

Abstract of the project

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5.1 Level 0 DFD

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Implementation

6.1 Algorithms

6.2 Development Tools

Chapter 7

Testing

Software testing is an investigation conducted to provide stakeholders with information about the quality of the product or service under test. Software testing can also provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation. Test techniques include the process of executing a program or application with the intent of finding software bugs, and to verify that the software product is fit for use. Software testing involves the execution of a software component or system component to evaluate one or more properties of interest. In general, these properties indicate the extent to which the component or system under test

- Meets the requirements that guided its design and development,
- Responds correctly to all kinds of inputs
- Performs its functions within an acceptable time
- Is sufficiently usable
- Can be installed and run in its intended environments, and
- Achieves the general result its stakeholders desire.

7.1 Testing Methodologies

Software testing methodology is for making sure that software products/systems developed have been successfully tested to meet their specified requirements and can successfully operate in all the anticipated environments with required usability and security. Software testing methods are traditionally divided into white and black-box testing. These two approaches are used to describe the point of view that a test engineer takes when designing test cases. White-box testing by seeing the source code tests internal structures or workings of a program, as opposed to the functionality exposed to the end-user. In white-box testing an internal perspective of the system, as well as programming skills, are used to design test cases. The tester chooses inputs to exercise paths through the code and determine the appropriate outputs. This is analogous to testing nodes in a circuit. While white-box testing can be applied at the unit, integration and system levels of the software testing process, it is usually done at the unit level. Black-box testing treats the software as

a black-box , examining functionality without any knowl- edge of internal implementation, without seeing the source code. The testers are only aware of what the software is supposed to do, not how it does it. Here the black-box testing is used for the system. The testing methods applied were:

- Unit Testing
Unit testing is a software development process in which the smallest testable parts of an application, called units, are individually and independently scrutinized for proper operation.
- Integration Testing
Integration testing is the phase in software testing in which individual software modules are combined and tested as a group. It occurs after unit testing.
- System Testing
System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the systems compliance with its specified requirements. System testing falls within the scope of black-box testing, and as such, should require no knowledge of the inner design of the code or logic.

7.2 Unit Testing

In the unit testing phase, the Background Subtraction Module, Feature Extraction, Finger-tip Tracking, Gesture Recognition and Gesture mapping were separately tested.

7.2.1 Background Subtraction Module

The images from the camera feed is provided to the Background Subtraction module in RGB colour space. The output images were in HSV filtered with Colour Ranges as expected.

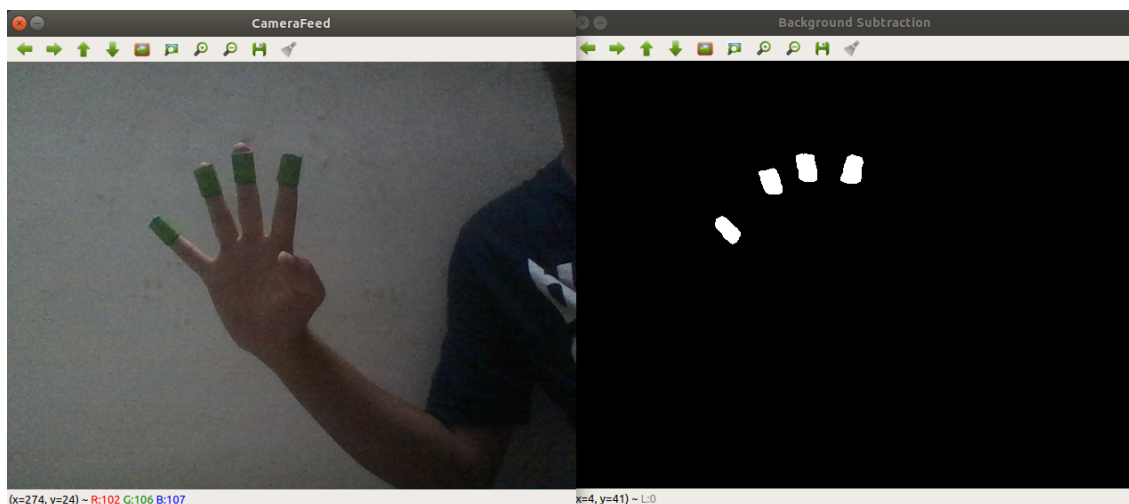


Figure 7.1: Background Subtraction Module

7.2.2 Feature Extraction

The output from the background subtraction module is fed into the feature Extraction module. This module computes the convex hull and finds the separate shapes and finds the centroids of each hull.



Figure 7.2: Feature Extraction Module

7.2.3 FingerTip Tracking and Gesture Recognition

The Finger tip tracking module tracks the centroids movement over multiple frames and the Gesture Recognition Module recognizes the gesture.

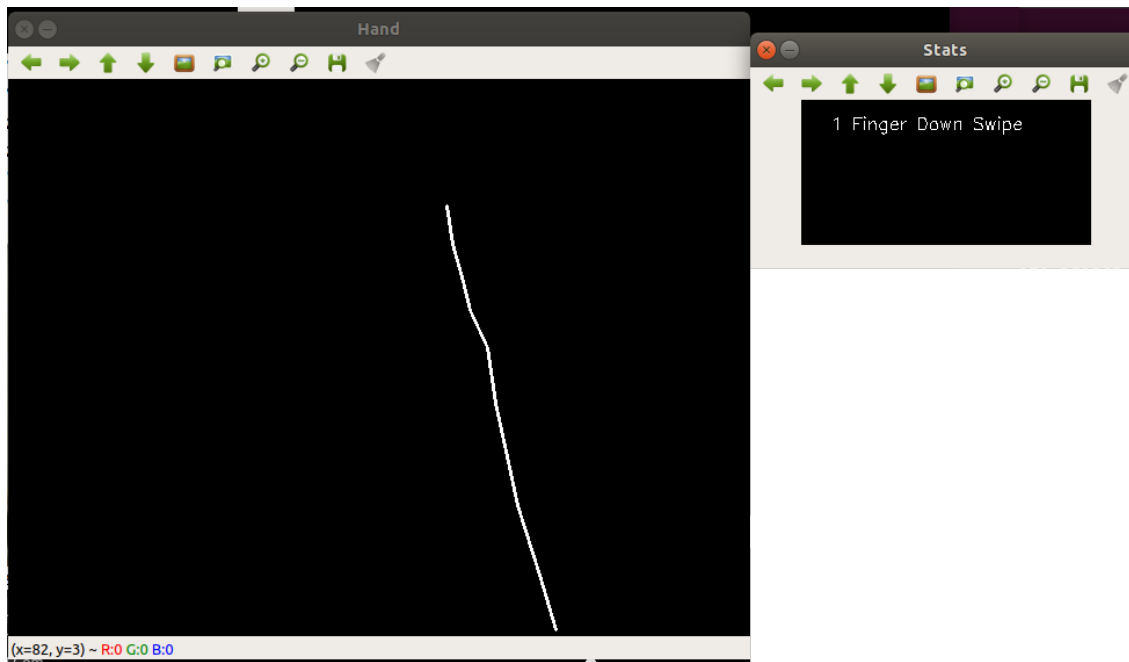


Figure 7.3: Finger Tip Tracking and Gesture Recognition

7.3 Integration Testing

Different modules were combined and was tested to see if the modules interact properly and produce correct output. The Background Subtraction Module provided its output to the feature extraction module which then finds the convex hulls. The output is passed to the finger-tip tracking module which tracks the direction and number of fingers. The output is successfully passed to the Gesture Recognition module which allots the gesture. Finally the output is passed to the Gesture Map module which executes the gesture in the Linux GUI.

7.4 System Testing

After the integration testing, we do the system testing. In system testing the whole modules are connected in order; the background subtraction module is integrated with the feature extraction module, the feature extraction module is integrated with the fingertip tracking and also the gesture recognition module and gesture mapping module. The whole system is integrated.

Chapter 8

Graphical User Interface

8.1 GUI Overview

8.2 Main GUI Components

Chapter 9

Results

Include screenshots of the project.

Chapter 10

Conclusion

Chapter 11

Future Scope

Chapter 12

Publication

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[1]