

## **ACKNOWLEDGEMENT**

I am happy to present this project after completing it successfully. This project would not have been possible without the guidance, assistance and suggestions of many individuals. I would like to express my deep sense of gratitude and indebtedness to each and every one who has helped me make this project a success.

I heartily thank **Principal, Dr. MOHAN BABU G N, BMS Institute of Technology & Management**, for his constant encouragement and inspiration for allowing me in taking up this project.

I heartily thank **Head of the Department, Dr. ANIL G N, Professor, Department of Computer Science and Engineering, BMS Institute of Technology & Management**, for his constant encouragement and inspiration during the course of the project.

I gracefully thank my Project Coordinator and Project Guide, **Dr. Anupama HS, Associate Professor, Department of Computer Science and Engineering**, for her intangible support and for being constant support for my project.

Special thanks to all the staff members of Computer Science Department for their help and kind co-operation.

Lastly, I thank my parents and friends for the support and encouragement given to me in completing this precious work successfully.

**MEGHANA.M (1BY15CS049)**

## **ABSTRACT**

Hand gesture recognition is to interpret the human gestures using certain mathematical algorithms for computer interaction. They are widely used in gaming, media player control, robot control etc. It enables the humans to interact with the machine directly without any means of mechanical devices thereby improving the work efficiency of the machine used. It makes it possible for the cursor on the screen to move accordingly by just pointing our finger. Hand gesture recognition plays an important role as it helps in the development of human-centered human-computer interaction. Gesture recognition is very useful in situations where processing of the information cannot be conveyed through text or speech.

In our project hand gestures are used to train the model and perform certain actions like scrolling down a page, scrolling up a page, zooming in, and zooming out. The gestures are recorded in real time and sent to the model trained using convolutional neural networks (CNN) which sorts the gestures and maps them to their corresponding actions. PyAutoGUI is used to control the PDF or book using the commands that are generated based on the respective hand gestures made.

The model that has been created so far is capable of performing only the given list of actions for the trained gestures. It will be able to recognize only one hand within the frame. Even if it recognizes multiple hands the gestures will not have an effect on the PDF or book used due to ambiguity that arises. The model correctly classifies the hand gestures and performs the much-needed actions with an accuracy of 99.94 % on the training dataset and an accuracy of 92% on the test dataset.

# **TABLE OF CONTENTS**

ACKNOWLEDGEMENT	I
ABSTRACT	II
TABLE OF CONTENTS	III
LIST OF FIGURES	IV
LIST OF TABLES	V

<b><u>CHAPTER NO.</u></b>	<b><u>TITLE</u></b>	<b><u>PAGE NO.</u></b>
Chapter 1	INTRODUCTION	01
Chapter 2	LITERATURE SURVEY	06
Chapter 3	SYSTEM REQUIREMENTS SPECIFICATION	14
Chapter 4	SYSTEM ANALYSIS	16
Chapter 5	SYSTEM DESIGN	21
Chapter 6	IMPLEMENTATION	26
Chapter 7	SYSTEM TESTING	34
Chapter 8	CONCLUSION, FUTURE ENHANCEMENT AND SNAPSHOTS	39
	REFERENCES	54

## **LIST OF FIGURES**

<b><u>FIGURE NO.</u></b>	<b><u>CAPTION</u></b>	<b><u>PAGE NO.</u></b>
Figure 1.1	Flow Chart of Proposed System	04
Figure 5.1.1	Architectural Design	21
Figure 5.2.1	Level 0 DFD	22
Figure 5.2.2	Level 1 DFD	23
Figure 5.3	Flow Diagram	24
Figure 5.4	Sequence Diagram	25
Figure 6.1	Flow of Modules	26
Figure 6.5.1	Fist Dataset	31
Figure 6.5.2	Palm Dataset	31
Figure 6.5.3	Swing Dataset	31
Figure 6.5.4	Peace Dataset	32
Figure 6.5.5	Code for integration of PyAutoGUI	33
Figure 8.3.1	Display of Windows	40
Figure 8.3.2	Prediction of Palm Gesture (Zoom In)	40
Figure 8.3.3	Prediction of Fist Gesture (Zoom Out)	41
Figure 8.3.4	Prediction of Swing Gesture (Right)	41
Figure 8.3.5	Prediction of Peace Gesture (Left)	42
Figure 8.3.6	Training the Model	42

## **LIST OF TABLES**

<b><u>TABLE NO.</u></b>	<b><u>CAPTION</u></b>	<b><u>PAGE NO.</u></b>
<b>Table 2.1</b>	<b>Literature Survey</b>	<b>06</b>
<b>Table 4.1</b>	<b>Functional Requirements</b>	<b>18</b>
<b>Table 4.2</b>	<b>Non Functional Requirements</b>	<b>19</b>
<b>Table 7.1</b>	<b>Unit Testing</b>	<b>36</b>
<b>Table 7.2</b>	<b>Integration Testing</b>	<b>37</b>
<b>Table 7.3</b>	<b>System Testing</b>	<b>38</b>