SIGN LANGUAGE TRANSLATOR

A PROJECT REPORT

submitted by

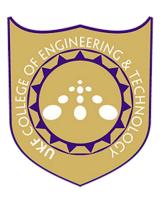
AKHIL A (UKP16CS006)
AKHIN A (UKP16CS007)
ASHIK SB (UKP16CS014)
HARIGOVIND K (UKP16CS024)

to

the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree

of

Bachelor of Technology In Computer Science and Engineering



Department of Computer Science and Engineering

UKF College of Engineering and Technology Parippally, Kollam-691302

MAY 2020

DECLARATION

We undersigned hereby declare that the project report "Sign Language Translator", submitted for partial fulfilment of the requirements for the award of degree of Bachelor of Technology of the APJ Abdul Kalam Technological University, Kerala is a bonafide work done by our team under supervision of Asst. prof. Ms. Remya Shaji. This submission represents my ideas in my own words and where ideas or words of others have been included, we have adequately and accurately cited and referenced the original sources. We also declare that we have adhered to ethics of academic honesty and integrity and have not misrepresented or fabricated any data or idea or fact or source in my submission. We understand that any violation of the above will be a cause for disciplinary action by the institute and/or the University and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been obtained. This report has not been previously formed the basis for the award of any degree, diploma or similar title of any other University.

Parippally Akhil A

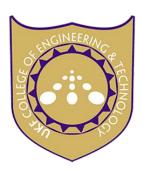
15-07-2020

Ashik SB

Harigovind K

Akhin A

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING UKF COLLEGE OF ENGINEERING AND TEHNOLOGY PARIPALLY, KOLLAM-691302



CERTIFICATE

This is to certify that the project report entitled "SIGN LANGUAGE TRANSLATOR" submitted by Akhil A (UKP16CS006), Akhin A (UKP16CS007), Ashik SB (UKP16CS014), Harigovind K (UKP16CS024) to the APJ Abdul Kalam Technological University in partial fulfilment of the requirements for the award of the Degree of Bachelor of Technology in Computer Science And Engineering is a bonafide record of the project work carried out by him under my guidance and supervision. This report in any form has not been submitted to any other University or Institute for any purpose.

Ms. Remya Shaji Internal Supervisor **Dr. Ramani K**HEAD OF THE DEPARTMENT

CONTENTS

Contents	Page No.
ACKNOWLEDGEMENT	i
ABSTRACT	ii
LIST OF FIGURES	iii
ABBREVIATIONS	iv
CHAPTER 1 INTRODUCTION	1
1.1 GENERAL BACKGROUND	1
CHAPTER 2 LITERATURE SURVEY	3
2.1 THEORETICAL INVESTIGATIONS	3
2.1.1 SENSOR BASED APPROACH	3
2.1.2 VISION BASED APPROACH	4
CHAPTER 3 PROBLEM DEFINITION	6
CHAPTER 4 EXISTING SYSTEM	7
4.1 DATA-GLOVE APPROACH	8
4.2 VISUAL-BASED APPROACH	9
CHAPTER 5 PROPOSED SYSTEM	11
5.1 PRE-PROCESSING	12
5.2 IMAGE PREPARATION	12
5.3 SHAPE DETECTION	13
5.4 SHAPE SIGNATURE	13
5.5 SIGN RECOGNITION	13
5.6 RESULTS COMBINATION	13
CHAPTER 6 SYSTEM REQUIREMENTS	17
6.1 SOFTWARE REQUIREMENTS	17
6.1.1 PYTHON 3.6	17
6.1.2 TENSORFLOW FRAMEWORK	18
6.1.2.1 TENSORFLOW EXECUTION	19

6.1.3 KERAS API	20
6.1.4 OPENCV	21
6.1.5 PYQT	22
6.1.6 TKINTER	24
6.1.7 OFFLINE TTS ASSISTANCE FOR PYTHON	26
6.2 HARDWARE REQUIREMENTS	26
6.2.1 INTEL PENTIUM DUAL CORE E6600 3.06GHZ	27
6.2.2 HARD DISK	27
6.2.3 RAM	27
6.2.4 GRAPHICS CARD	28
CHAPTER 7 IMPLEMENTATION	29
7.1 CONVOLUTIONAL NEURAL NETWORK	29
7.1.1 DESIGN	30
7.1.1.1 CONVOLUTIONAL	30
7.1.1.2 POOLING	31
7.1.1.3 FULLY CONNECTED	31
7.1.1.4 RECEPTIVE FIELD	31
7.1.1.5 WEIGHTS	31
7.1.2 BUILDING BLOCKS	32
7.1.2.1 CONVOLUTIONAL LAYER	32
7.1.2.2 LOCAL CONNECTIVITY	33
7.1.2.3 SPATIAL ARRANGEMENT	33
7.1.2.4 PARAMETER SHARING	34
7.1.2.5 POOLING LAYER	34
7.1.2.6 ReLU LAYER	35
7.1.2.7 FULLY CONNECTED LAYER	36
7.1.2.8 LOSS LAYER	36
7.2 IMPLEMENTED MODULES	37
7.2.1 PREDICTOR MODULE CODE	39
7.2.2 SINGLE SCAN MODULE CODE	40

7.2.3 SENTENCE SCAN MODULE CODE	41
7.2.4 EXPORT FILE MODULE CODE	43
7.2.5 CREATE GESTURE MODULE CODE	43
CHAPTER 8 ADVANTAGES	45
CHAPTER 9 FUTURE SCOPE	46
CHAPTER 10 RESULT	47
CHAPTER 11 CONCLUSION	52
REFERENCES	53