

Final Year Project Report
Dynamic hand gesture recognition using kinect



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Dedication

I dedicate my work to the deaf community. In this research, our main focus was to bridge the gap between signers and non-signer. Solving this issue wouldn't make deaf community feel alienated in public places and in places where interpreters aren't available readily. This project can serve as a framework to solve the issue and work for the betterment of deaf community.

Final Approval

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Acknowledgment

First of All I want to thank ALLAH for giving me the guidance and courage to beat all the odds and achieve the goal that seemed impossible few months ago.

I much obliged to Sir Nabeel Sabir Baloch Khan and Dr Adnan Shahzada for supporting me, motivating me, guiding me and helping me throughout my project. I thank them both for taking time out of their busy schedules for my project.

In the end, I want to thank my mother who has been very supportive of me during the whole bachelor's degree program, my younger brother for helping me with my project and being a constant support.

Project Title	Dynamic Hand gesture recognition using Kinect
Objective	The main objective of the system is to remove the communication barrier between sign language signers and non signers. The system recognizes the dynamic hand gesture and outputs the recognized gesture in the text form.
Undertaken by	Tayyba Naz
Supervised by	Sir Nabeel Sabir Baloch Khan
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Completion Date	9-9-2016
Tools Used	Visual Studio, Kinect
Operating System	Windows 7
Documentation	According to new format

Abstract

With a population of 70 million deaf people in world [1], Pakistan has approximately 0.3 million [2] deaf people residing on its land. There have been several researches done in developed countries to come with a mechanism to give voice to the deaf community. American Sign Language, British Sign language has been standardized for American and British deaf community consequently. Other countries have developed their own sign language. In Pakistan, deaf community uses Pakistan Sign Language (PSL) as a mode of communication. To overcome the gap between signers and non-signers and to give voice to deaf community, we have proposed an automated solution which uses Microsoft's sensor device, Kinect-1. Our system uses skeleton and depth frame data provided by Kinect. Depth data is used to recognize the hand shape. Other features are computed from skeleton data. Gestures are computed by a hierarchical neural network which is trained using back-propagation method. First network computes the hand Shape. The second network recognizes the gesture performed taking the recognized hand shape and other features as input. The system outputs the recognized gesture in the form of text. The system works with an accuracy of 87.5%.

REVISION CHART

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Chapter-1

Introduction

All animals communicate with each other in different forms. Ants, bees, apes communicate with each other using some sort of medium. Only human beings have developed language to converse and express their opinions. Our ancestors started speaking million years ago, but with time the languages expanded and diversified. No one really knows how languages originated. What researchers believe is that the linguistic of each language originated from one language. Languages are the root of human culture. Currently in the world, more than 6000 languages are spoken [3]. Each language has its own dialect which varies from region to region.