GOA COLLEGE OF ENGINEERING
FARMAGUDI, GOA

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

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HUMAN IDENTIFICATION USING GAIT RECOGNITION

by

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A project submitted
in partrial fulfilment of the requirements
for the degree of
Bachelor of Engineering
in
Electronics and Telecommunication Engineering
GOA UNIVERSITY

under the guidance of

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CERTIFICATE

This is to certify that the project entitled

"HUMAN IDENTIFICATION USING GAIT RECOGNITION"

submitted by

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has been successfully completed in the academic year 2016-2017 as a partial fulfilment of the requirement for the degree of BACHELOR OF ENGINEERING in Electronics and Telecommunication Department, at Goa College of Engineering, Farmagudi.

_____ _____

(Internal Examiner) (External Examiner)

Place: Farmagudi, Ponda, Goa
Date:

PROJECT APPROVAL SHEET

The project entitled

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completed in the year 2016-2017 is approved as a partial fulfilment of the requirements for the degree of **BACHELOR OF ENGINEERING in Electronics and Telecommunication Engineering** and is a record of bonafide work carried out successfully under our guidance.

_____

(Project Guide)
Milind Fernandes
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Professor, ETC Dept.

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Place: Farmagudi, Ponda, Goa
Date:

Acknowledgement

The success of our work is incomplete unless we mention the names of our respected taechers who made it possible, whose guidance and encouragement served to beacon light and crowned our efforts with success.

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Abstract

In recent years, biometric recognition and authentication has attracted a significant attention due to its potential applicability in social security, surveillance systems, forensics, law enforcement, and access control. A biometric system can be defined as a pattern-recognition system that can recognize individuals based on the characteristics of their physiology or behaviour. One biometric technique for unintrusive identification is gait recognition which basically identifies people by the way they walk. In former work, gait recognition is mainly achieved with camera systems. In this study, we present an approach for gait recognition using Microsoft Kinect V2, a peripheral for the gaming console XBOX One, which provides us with marker less tracking of human motion in real time. We extract and evaluate a number of static and kinematic features and present the results of various classification algorithms for person identification.

Chapter 1

Introduction

Compared to other biometric features such as the iris and fingerprint. Gait has some inherent advantages 1) Perceivable at a distance, on-contact, non-invasive 2) Doesnt require user cooperation 3) Gives fairly accurate readings under low light conditions. Also disguising, hiding ones gait or imitating some other persons gait is practically impossible. As a result it has fascinated several security-sensitive environments such as classified research and nuclear labs, military, banks etc. Gait recognition is particularly useful in crime scenes where other biometric traits (such as face or fingerprint) might be obscured intentionally.

Two common categories of gait recognition are appearance-based and model-based approaches. Among the two, the appearance-based approaches suffer from changes in the appearance owing to the change of the viewing or walking directions. Model based ones are view and scale invariant and reflect in the kinematic characteristics of walking manner. In this study we present a model based approach using the Microsoft Kinect sensor which offers us a 3D model of the human skeleton with capability to track up to 25 joints of the human

body.

1.1 Motivation

The initial motivation to build a gait recognition system developed after watching the Gait Analysis scene in the movie Mission Impossible Rogue Nation (2015) where it was used for authentication for security purposes. Although at that time it felt as a futuristic technology, through research we realised that existing gait recognition approaches mostly use standard video cameras for capturing and recording the movement of walking persons. Here, the main difficulty lies in the extraction of characteristic features that can be used for identification. The challenges of existing gait recognition system and the possibilities Kinect offers lead to the assumption that the problem of gait recognition could be simplified using the Kinect sensor.

1.2 Proposed Idea

In this paper we propose a skeleton model based approach (provided by Microsoft Kinect Sensor) for gait recognition and person identification. Our system consists of three components: The first component records the skeletal data offered by Kinect using the SDK provided by Microsoft. The second component processes on this data using MATLAB for feature extraction. Finally we use different classification algorithms available in MATLAB Classification Toolbox to identify a person using previously recorded training data and compare their performance and accuracy. This is a prototypic implementation of a gait recognition

system, where we evaluate the possibilities of gait recognition using the Microsoft Kinect.

Chapter 2

Literature Review

2.1 Introduction

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Please feel free to add intermediate sections according to your project requirement.

2.2 Conclusion

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Chapter 3

Design/Implementation(whichever applicable)

3.1 Problem Statement

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ment. Work done: Block diagram, design(software, hardware), Implementation

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Chapter 4

System Analysis

4.1 Observations

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4.2 Results

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4.3 Discussion

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Chapter 5

Conclusion

5.1 General Conclusion

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5.2 Challenges

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5.3 Future Work

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Bibliography

[1] Kenneth J. W. Taylor, Peter N. Burns, Peter N. T. Wells. Clinical Applications of Doppler Ultrasound Second Edition, pages 1-3.

[2] http://www.genesis-ultrasound.com/history-of-ultrasound.html

[3] https://wiki.engr.illinois.edu/display/BIOE414/History+of+Color+Doppler+Ultrasound

[4] William R. Hendee and E. Russell Ritenour. Medical Imaging Physics, Fourth Edition, pages 344 - 346, 2002.

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Appendices

Appendix A

Appendix

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Appendix B

Data Sheets

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