**Abstract**

This research project is carried out to determine some of the basic human motion detection algorithm that had been founded or developed or even researched previously. This thesis report would bring a presentation of these algorithms for researchers to get a basic idea of performing an algorithm for human motion detection systems. The main algorithm being discussed here are those implementing image subtraction methods and foreground-background segmentation approach. The thesis report also is aimed to give readers a main idea of the architecture of a human motion detection system in applications. This report is also written with the purpose of documenting the design and development of a prototype human motion detection system. Here, we presented some basic ways to perform a human motion detection algorithm and also a new way to consider for background updating using spatial information instead of temporal. The experiments carried out to evaluate the performance of the prototype system is attempted and its results being recorded in this paper as well. As a conclusion, this paper is aimed to researchers interested to research on the basic idea of human motion detection algorithm using image subtraction and foreground-background segmentation techniques.

**INTRODUCTION**

this project is to be linked with another project to come up with the final system called Human Motion Detection System. This project would be focused on the Video Motion Detection module where we would perform to develop a module for a technique that we prefer to use in this project. This module would record down motion and pass it into the next module that would be on object classification where it classify human and non-human object.

Human Motion Detection System can be used in surveillance and security systems. The system that this project came up with will be useful for security in a fixed restriction area. Therefore, the background of the targeted area is assumed to be non-moving and considerations of sudden change in lightings are ignored as well. However, the considerations of other factors are taken into consideration. Basically, the initial plan was to use a technique called image segmentation to abstract the foreground image from the source image obtained and later processed to filter out noises or small images disturbance. To perform this, we would use Open Source Computer Vision Libraries [19] from Intel to obtain contours from the foreground image subtracted. We will map these contours’ pixels with the original images’ to 3 send raw data into the other module of the project performed by our partner on classifying the image frame obtained on whether it’s a human motion or not. His module would return a percentage of recognition rates on whether the motion belongs to human or not. Based on a level on acceptable percentage that it is sure it’s a human motion, the program would detects and displays the motion with a bounding box on the human which is in a different colour to other moving objects that caused motion as well since all moving objects are bounded by the rectangles. The program will record down the scene when the motion event occurs.

**PROBLEM FORMULATION**

The hypothesized function of this monitoring system is to provide the users with information about the detection of an object’s movement in order to deliver useful information about the motion with connection to the theory of motion through movement. The subjective experience of motion is simple hypothesized as the feedback from tiny movement and differences between two frames. In this study, the practice item of motion was focused on comparison among

four detectors.

The objectives of the fundamental studies are as follows:

* To implement the algorithm for motion detection analysis
* in a newly developed monitoring system.
* To compare and analysis among four detectors used
* (Current and Previous, Pixellate, Blob Counter and
* Morph).

Counterbalancing should be instituted to control for order effects and efforts made to ensure that all subjects complete

**HARDWARE REQUIREMENTS:**

**(Minimum)**

* System : Pentium/Intel.
* Hard Disk : 128 GB.
* Input Devices : Keyboard, Mouse
* Ram : 2 GB

**SOFTWARE REQUIREMENTS:**

* Operating system : Windows /Linux/ MAC
* Compiler : VS code/Jupyter
* Coding Language : Python
* Some python libraries

**Conclusion**

The application presented in this thesis is a proof of concept on how to create an application

that can detect human motion in a room, which also uploads labeled images to a cloud

storage service. The created application is adapted to a smart phone with a 5 mega pixel

camera to yield optimal functionality. The application also needs an internet connection

and a Google Drive account in order to upload images to the cloud service. The created

application yields a good detection result with 94.18% accuracy on labeling the acquired

images with a correct label(filename), i.e labeling the image if it contains people or not.

The application is suitable in an environment which is static and the movement that occurs

is caused by human movement, for example a conference room. The application’s motion

detection has its limits, for example the application can not tell the difference between

moving objects and human movement.

**References**

[1] David Moore, “A real-world system for human motion detection and tracking”, California Institute of Technology, June 2003.

[2] Yang Song, Luis Goncalves, Pietro Perona, “Learning Probabilistic Structure for Human Motion Detection”, California Institute of Technology.

[3] Yang Song, Xiaolin Feng, Pietro Perona, “Towards Detection of Human Motion”, California Institute of Technology.

[4] Randal C. Nelson, “Qualitative Detection of Motion by a Moving Observer”, University of Rochester.

[5] Ming Xu, Tim Ellis, “Illumination-Invariant Motion Detection Using Colour Mixture Models”, City University, London.

[6] S. Birchfield, “Derivation of Kanade-Lucas-Tomasi tracking equation”,

[7] Jain, R., Kasturi R., Schunck G., “Machine Vision”, McGraw Hill, 1995

[8] Forsyth,D.A., Ponce,J., “Computer Vision: A Modern Approach”, Pearson Education, Upper Saddle River, NJ, 2003

[9] G. Johansson, “Visual perception of biological motion and a model for its analysis.”, Perception and Psychophysics, 14:201-211, 1973.