CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

Chapter 1, Introduction will have an overview on some topic which included project background, problem statement, objectives, scope of the project and lastly expected outcome.

1.2 PROJECT BACKGROUND

The goal of any night vision technology is to enable a person to see in the dark. In the past, night vision was implemented by making use of the infrared spectrum of electromagnetic waves and devices such as image intensifiers. With the growing popularity of digital computing, many digital image processing techniques have been proposed to implement night vision. These techniques can enhance the images captured by ordinary cameras under low light conditions and can be implemented completely in software. They do not require the use of infrared light and special devices. There are types of algorithms which can be able on camera in order to generate night vision effect.
Few of the popular and efficient algorithms for adjusting the contrast of an image are motion detection and histogram. With respect to night vision, many algorithms based on this technique have been proposed and successfully implemented. In this thesis an improved histogram equalization approach with respect to night vision is presented. This algorithm is applied to video surveillance which involves the capturing of image frames from a camera, video transmission, recording and buffering over a computer network and application of histogram equalization to these frames in real time. Due to these requirements, the efficiency of the technique used is of critical importance. As it is intended to be part of an intelligent video surveillance system, the quality of the images produced is also extremely important. The end result must be suitable for the application of object detection and pattern recognition algorithms which would otherwise not have been possible for images captured in the dark.

As a conclusion, this project will go through the development for a static programmed camera which equip with night vision function that can work under limited light intensity and utilize the programmed camera as object detection system that will able user to detect object under low light intensity, medium complexity of background and certain distance. This project presents the detection of intruder existence by using webcam system under different environment. The entire project is done by using image processing techniques via OpenCV which run on Linux environment. The challenge of this project focuses on the detection ability of intruder by using a webcam at a fixed distance in low light condition. The histogram of edges is generated to show the pixels value of every frame of the images. Intruders can be detected by detecting the changes occur in the edge image, the changes of histogram of edges and pixels value from the real-time video streaming through the webcam.
1.3 PROBLEM STATEMENT

The problem statements for this project are listed below:

i. The ability to detect intruders at night is needed in many places.

ii. An expandable programming architecture is required to implement complex algorithms for night vision and intruder detection.

1.4 OBJECTIVE

Objectives are tools that emphasize the plan and act as measurement for the goal. This project will have two main objectives which listed as following:

a. To use histogram and edge detection algorithms for intruder detection.

b. To investigate the performance of histogram and edge detection algorithms under various scenarios.

1.5 SCOPE OF PROJECT

The scope of project is listed as following:

a. Night vision camera programmed using OpenCV and Ubuntu.

b. Interface wired camera with the program.