



Faculty of Computer Science and Information Technology

**FACE RECOGNITION ATTENDANCE SYSTEM FOR JABATAN BEKALAN AIR LUAR BANDAR  
SARAWAK**

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## Declaration

The proposed project entitled “Attendance Using Face Recognition System for Jabatan Bekalan Air Luar Bandar Sarawak” is conducted under supervisor Dr Lau Sei Ping, lecturer from Faculty of Computer Science and Information Technology of Universiti Malaysia Sarawak.

I hereby declare that my Final Year Project 1 is authentic. I have not copied any other student’s work or any other sources except where due reference that I took as a guide. This work has not been previously, or concurrently, used for other courses and this work has not been published.

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## Abstract

Attendance system is a system where it can monitor the attendance of people when they are participated in an activity at some particular place such as school or working place. This system is important to an organization as it can affect the working progress of the employee. Without attendance system, the employee attendance will be hard to track. The employee performance and quality will be decreased and some of them will take advantage by not going to work. Thus, lead to serious disciplinary problem.

In Malaysia, there are so many methods that used to record the attendance of employee such as Biometric, Radio Frequency Identification (RFID), QR code, punch card and others. In this project, Face Recognition Attendance System was proposed to take the attendance of Jabatan bekalan Air Luar Bandar (JBALB) Sarawak employee. This system worked by scanning the staff face in front of a camera. The key feature of these system is using employee face image to identify the employee identity. Furthermore, this system can eliminate the chances of human errors and reduce the manual effort since the traditional method which is writing down names on the attendance book is no longer being used.

## Abstrak

Sistem kehadiran adalah sistem yang memantau kehadiran seseorang apabila mereka turut serta dalam sesuatu aktiviti di tempat tertentu seperti sekolah atau tempat kerja. Sistem ini penting kepada sesebuah organisasi kerana ia boleh menjejaskan kemajuan pekerja. Tanpa sistem kehadiran, status kehadiran pekerja akan sukar dikesan. Prestasi dan kualiti pekerja juga akan berkurangan dan sebahagian daripadanya akan mengambil kesempatan dengan tidak hadir di tempat kerja. Oleh itu, hal ini akan menjerumus kepada masalah disiplin yang serius.

Di Malaysia, terdapat banyak kaedah yang digunakan untuk mengambil kehadiran pekerja seperti Biometrik, Pengenalan Frekuensi Radio (RFID), kod QR, kad punch dan lain-lain. Dalam projek ini, Sistem Kehadiran Pengesanan Wajah telah dicadangkan untuk mengambil kehadiran pekerja-pekerja Jabatan Jabatan Air Luar Bandar (JBALB) Sarawak. Sistem ini beroperasi dengan mengimbas wajah kakitangan di depan kamera. Ciri utama sistem ini ialah menggunakan imej wajah pekerja untuk mengenal pasti identiti pekerja. Selain itu, sistem ini boleh mengurangkan kesalahan kecuaiian manusia dan mengurangkan kerja manual kerana kaedah tradisional seperti menulis nama pada buku kehadiran tidak lagi digunakan

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# **Chapter 1: Introduction**

## **1.1 Introduction**

Jabatan Bekalan Air Luar Bandar (JBALB) is a new department which formerly known as JKR Water Supply Authorities. JBALB was launched in September 2015. Since JBALB is a new department the employee still taking their attendance using manual system writing and sign their name on the attendance book. To maintaining the attendance is very important in all the departments in order to check the performance of employees. Every departments have their own method in this regard either by taking attendance manually using the attendance book, punch card, and by advanced methods of automatic attendance using biometric techniques. By using all these methods employees have to take a long time to queue at time they enter the office. Many biometric systems are available, it consists of enrolment process in which unique features of a person is stored in the database and then there are processes of identification and verification. These two processes compare the biometric feature of a person with previously stored template captured at the time of enrolment. Biometric templates can be of many types like Fingerprints, Eye Iris, Face, Hand Geometry, and voice. This proposed system uses the face recognition approach for the automatic attendance of employees once they are entering their office. This face recognition system consists of two steps which are first step faces are detected in the image and then these detected faces are compared with the database for verification.

## **1.2 Problem statements**

Jabatan Bekalan Air Luar Bandar was a newly setup government agency which still relay on manual attendance taking by writing the employee's name manually on the book. This manual attendance taking is not efficient and very time-consuming when the employees have to queue up to write their name before and after the office hour. Other than that, the staff who in charge to record the attendance into a system also has to do it manually by inserting the information from the attendance book one by one into Microsoft Excel every month. They also need to identify the late employees from the attendance book manually which is not very accurate because some of the employees may write down false information. Furthermore, the staff that in charge the attendance might also overlooked some information.

## **1.3 Scope**

This system will be used by Jabatan Bekalan Air Luar Bandar employees to record their attendance. The main focus of this system is to design an efficient system that use facial recognition to manage the attendance records of employees.

## **1.4 Objectives**

- 1) To recognise the employee via face recognition.
- 2) To record the employee attendance using face recognition.
- 3) To produce performance report based on recorded attendance.

## 1.5 Brief methodology

The development of this system is using Software Development Life Cycle (SDLC). The phase conducted as follow:

- i. Determine problem and objectives  
Several problems were discovered at Jabatan Bekalan Air Luar Bandar where the employees still rely on manual attendance taking which is not very effective to be use nowadays. The objective of this system is to update the employee attendance automatically in efficient way by using facial recognition attendance system. This objective is defined after having a discussion with the staffs that responsible on the attendance system records.
- ii. Identify user requirement information  
Users of this system have to be a Jabatan Bekalan Air Luar Bandar employees. They required this system can take their attendance automatically by recognizing their face and they can generate report from the system.
- iii. Analyse system needs  
In this phase, the developer will need to collect all the information or requirement that needs by the system. Building a right and suitable function of the system is needed to ensure the system will works well.
- iv. Designing the system  
After collecting all the information and requirements the developer can understanding better and can start designing the system based on the information that have been collected in the earlier phase.
- v. Developing the system  
In this phase, this system will be constructed by using a computer, camera and the employee facial patterns information. During this developing phase, developer will work on coding and designing the system with suitable software tools.
- vi. Testing the system  
At this phase, this facial recognition system will be tested and observed on how the system work. Any problem occurs, improving and fixing up will done by this phase.
- vii. Implementing and evaluating the system  
The final phase, the system will be launched for trial to the Jabatan Bekalan Air Luar Bandar employees for them to experience and give their review about the system. Then the reviews or opinions will be taken into consideration for reference to improvise the system. If the system meets their requirement, the system is ready to be used.

## 1.6 Significance of project

This system will be implemented for better results regarding the management of attendance records. This system also will conserve more time considering that facial recognition is almost instant, it grants a quick and efficient verification of a person. Other than that, it also reduces the amount of manual works of the employees. The employees just need to scan their face every morning to record their attendance.

## 1.7 Description of the project

Face Recognition Attendance System is an automated identification system that can recognise a person face features that are stored in the database. This technology used to track the employee attendance. This attendance system detects the employee in front of the camera and then automatically updates their attendance in the attendance database.

## 1.8 Project schedule

Project schedule is a guideline in completing the project. This is a timeline from starting the final year project 1 until final year project 1 symposium.

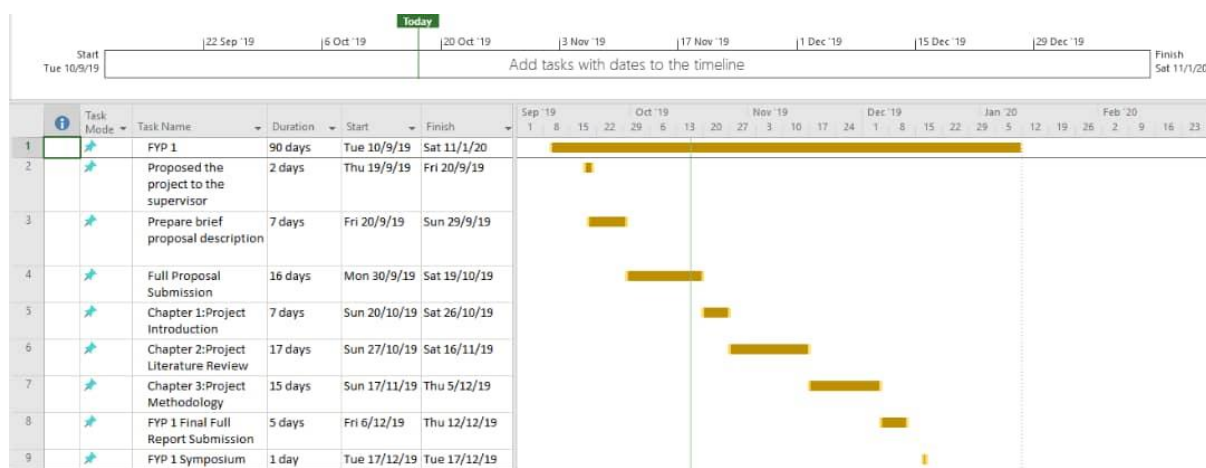


Figure 1.1 FYP 1 Project Schedule

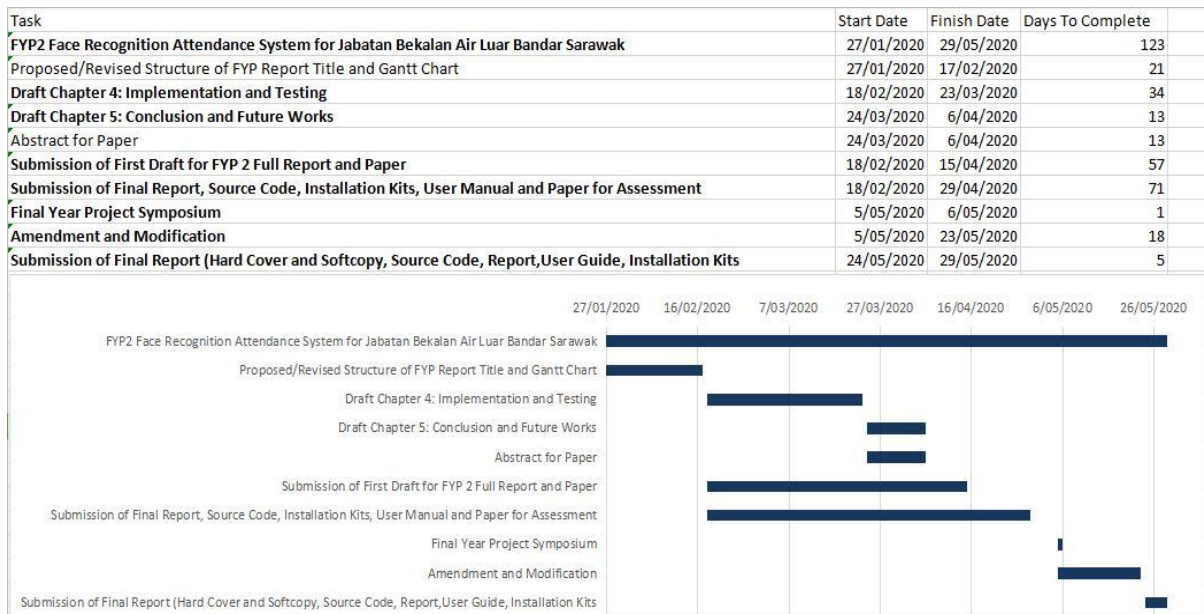


Figure 1.2 FYP 2 Project Schedule

## 1.9 Expected outcome

This project is expected to benefit the Jabatan Bekalan Air Luar Bandar department by reducing the employee manual effort and shorten the time taken as this system can improve the way the employees taking their attendance every day. This system also helps to update employees attendance automatically only by detecting and recognizing their faces.

## 1.10 Report Outline

The following list is the report outline of this proposed system which consists of five chapters.

### 1.10.1 Chapter 2: Literature Review

Chapter 2 will study about the review from published information or article and any existing system or method that related. This chapter will provide a clear view of the proposed project.

### **1.10.2 Chapter 3: Requirement Analysis and Design**

Chapter 3 explains more about the methodology or the process that involve in designing and developing this system. The methodology that will be applied is System Development Life Cycle (SDLC).

### **1.10.3 Chapter 4: Implementation and Testing**

Chapter 4 discuss on the implementation and testing phases. In this phase, the layout of the system will be shown in clearer an easy to understand.

### **1.10.4 Chapter 5: Conclusion and Future Work**

Chapter 5 contents the summary of the whole proposed system developing progress from the early phase which is problem statement until the implementation phase. In this chapter also will discuss about the improvement that can be carried on in the future.

## **Chapter 2 Literature Review**

### **2.1 Introduction**

In this chapter, the review about current related work on attendance system will be briefly discussed which will guide the next step of development phase. Literature Review is an important part where the research about other similar existed project are being review and analyse to gain information and knowledge (RV Labaree, 2009). For example, the concept of the system, the theory and the method of the project all can be learned in this literature review.

In order to develop the face recognition attendance system, literature review is important to compare the proposed system with the existed attendance taking systems. The studies of literature review will provide a helpful needs and ideas.

### **2.2 Overview**

Literature review that carried out before developing process will help to obtain more information and knowledge on the related or similar systems. The reviews from the existed systems are required to improve the proposed system based on the system details and comparisons. Other than that, the review from the previous systems also help to identify the problems that existed systems had faced.

### **2.3 Existing Attendance Systems**

There are so many existing attendance systems been proposed and developed using different methods or technologies to record employee's attendance. These are several attendance systems that have been studied:

### 2.3.1 Face Recognition System based Lecture Attendance System

Kawaguchi and Shoji have been proposed a system that can record student's attendance automatically for lecture by using camera to recognise the students face based on continuous observation. In the same time, all the information regarding the attendance of students, positions and images of the student's face can be obtained by lecturer during the lecture.

There are two types of cameras using in this system. First is the sensing camera that installed on the ceiling to gain the information of the student's seats using Active Student Detecting Method (ASD). Second is capturing camera which put in front on the student's seats to capture the images of student's face. After collecting the seats information and captures student's face images, the system will start processing the face images such as detecting and recognizing the captured image. Then, all of the face detection data and face recognition data will be recorded into the database. The attendance information of the system will process the attendance of students by continuous observation of face recognition. Finally, the position and attendance of student are recorded into the database. Figure below shows the Architecture of the system.

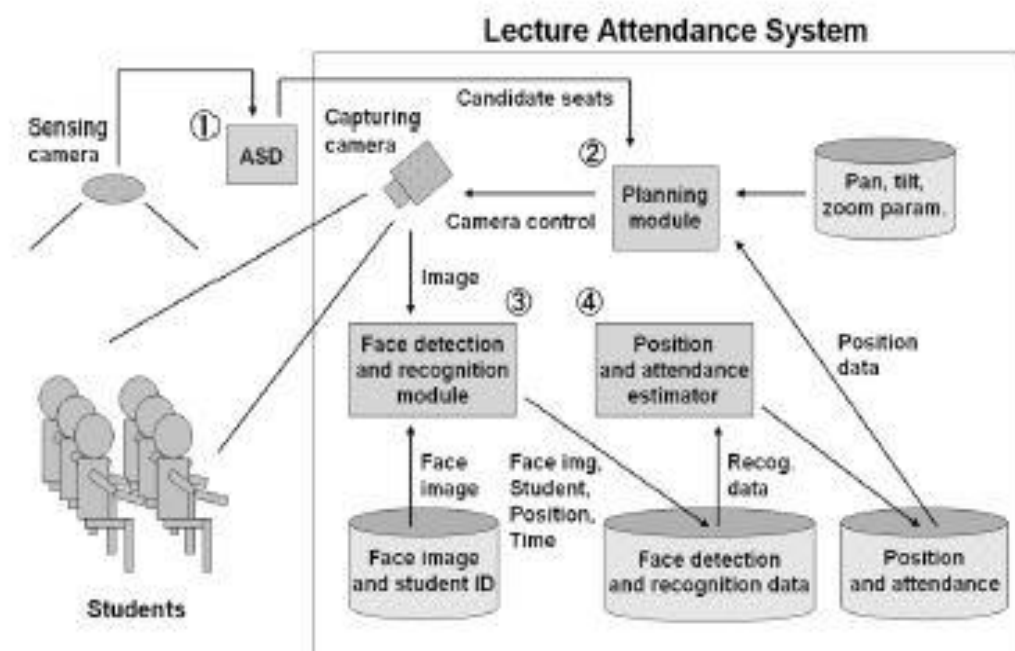


Figure 2.1 Architecture of the Face Recognition System (Kawaguchi & Shoji, 2005)

This system uses the method of Active Student Detecting (ASD) to estimate the existence of student sitting on the seat. ASD estimate student existence by using the