Kombolcha Institute of Technology (KIoT)

College of Informatics(COI)
Department of Software Engineering

Project proposal On Title: Facial Recognition and Montering System for Student Cafeteria

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1 Chapter One

1.1 Introduction

Nowadays the rapid growth of computing technology enforce peoples to use smart and learned system where as the developers also engage on its development.such system are recently under operation using concepts of OpenCV . OpenCV (Open Source Computer Vision Library: http://opencv.org) is an open-source BSD-licensed library that includes several hundreds of computer vision algorithms. The document describes the so-called OpenCV 2.x API, which is essentially a C++ API, as opposite to the C-based OpenCV 1.x API.

Having this we are going to develop automated Student facial cafeteria system for Kombolcha Institute of Technology(KIoT): Student facial cafeteria system is a system using face detection mechanism to monitor cheaters and make cafeteria system computerized in net. Student facial is web application system in order to applied as best mechanism using new technology of OpenCV.

1.2 Background of the organization

Wollo University Established in 2007, and it is a public higher education institution located in the city of Dessie and Kombolcha, Amhara. Officially accredited/recognized by the Ministry of Education, Ethiopia, Wollo University (WU) is a coeducational higher education institution. Wollo University (WU) offers courses and programs leading to officially recognized higher education degrees such as both bachelor and master program in several areas of study. WU also provides several academic and non-academic facilities and services to students including a library, as well as administrative services.

1.2.1 mission

Wollo University has the following missions to accomplish:

- Provide quality higher education at all levels through regular, extension, distance and continuing education modes so as to produce competent professionals who can support the development endeavor of the country;
- Produce competent entrepreneurs who could contribute to the technology transfer endeavors of the country;
- Undertake researches that help to solve the socio-economic problems of the country and that can also add new values and knowledge to the society;

1.2.2 vision

Wollo University envisions being one of the top five Universities in terms of outstanding quality education, research, Technology transfer, and community development services in Ethiopia by 2017 E.C/ 2025 G.C

1.3 Statements of the problem

- For many years ago, in cafeteria people use manual means of ticking students meal card.
- The ticker Must cross check owner of meal and photos in meal
- Student may cheat through using two or more meal cards.
- Students and tickers also cheat different means
- Students who is academically dismissed may use cafeteria.
- tedious and inefficient
- their may be high queue
- Diffcult to reporting mechanism

1.4 Objective of the project

1.4.1 General Objective

The general objective of this project is to Automated Student Cafeteria Facial Recognition System for KIoT.

1.4.2 Specific Objective

I Requirements gathering and planing for budget expenses in project work.

II Scheduling the tasks in timetable.

III System analysis and design.

IV configuring and upsetting the necessary tools.

V Implementation and Testing.

VI Installation of software for the project works (deployment) and user manual (help)

VII Give training for Users

1.5 Scope and Limitation

1.5.1 Scope

The scope of our project is complete Automated Student Cafeteria Facial Recognition System for any Cafeteria's in the university.

1.5.2 Limitation

No expected Limitation is right here.

1.6 Methodology

1.6.1 Data gathering Technique

We preferred object oriented approach because of:-

- Combine the problem and solution
- domain modeling activities.
- Reduce maintenance.
- Real world modeling.
- Re usability of code.
- since python which is both procedural and object oriented programming language.

1.6.2 Development Methodology(Approach)

1.6.3 Development Tools

Hardware Tools

This project application requires some hardware tools for its performance.

- Smart phones.
- Video Recorder camera
- Computer (desktop) .
- 8 GB RAM with processor: Intel(R) Core(TM) i5-2430m CPU @ 2.40GHz.
- 16 GB Flash Disk.
- (Laptop) Personal computer.

Software Tools
Front-End Technologies

- HTML5:- To View The Collected Data through the web browser
- CSS (Bootstrap 4):To make the HTML page stylish and responsive
- JavaScrip(Jquery,AJAX,JOSN):To Make The Web Page Interactive and Validation aspect.

Back-End Technologies

- **Python 2.7 :**All The Codes Mainly Written in Python
- **External Python Modules OpenCV 3.4.0:** To Capture and Record Video From The Webcam

- **Haar Cascade:**To Detect and Recognize The User Face By Using Known Algorithms
- **Flask:**To Send The Collected Data To The Browser By Creating A Local Web server
- **ZBar:**To Detect and Decode The QR Code
- **MySQL:** To Store All The Information Need For the Cafeteria

Other Tools

- **Sublime text 3:** To edit source codes
- **Latex (latext):**To the software requirement specification document(SRS)
- **Latex(bemear):**To prepare presentation.
- **chrome:**To view the data in HTML enabled forms.
- **Firefox:** To view the data in HTML enabled forms.
- **All Adobe products :** For best layout and User interface design.

1.7 Significance

From developer's point of view

- For our experience to do better jobs.
- To work with as open source software developer .
- To make it applied the theoretical software engineering principle in practice
- To develop problems solving skill real world ideals.

From user's point of view

- To save resource (time,budget and human labor resource).
- To make the easy for reporting generation
- To reduce human resource (number of employees)
- To eliminate cheater during meal time
- To reduce queue during meal time
- To make easy ,fast and computerized system.

2 Chapter Two

2.1 Introduction to Existing System

Existing system description

- For many years ago, in cafeteria people use manual means of ticking students meal card.
- The ticker Must cross check owner of meal and photos in meal
- Student may cheat through using two or more meal cards.
- Students and tickers also cheat different means
- Students who is academically dismissed may use cafeteria.
- Tedious and inefficient
- Their may be high queue
- Diffcult to reporting mechanism

2.2 Suplmentary Requirments

2.2.1 Bussinus Rule

- Student must be register as member of Student facial recogniation system.
- Student must be active member.
- Each student must have Barcode
- Student those who are acheating more than five will be enter as member of cheaters
- Cheating by usin others is not allowed and detected through indivdual face detection.

2.2.2 Constraints

- Thier must be uninterrupted power supply(UPS).
- Thier must be high speed of processing computer.
- Thier must be Good Quality camera.

2.3 Proposed System

2.4 Software Requirment Specification

2.4.1 Functional Requirment

1. The system allows the user to enter once read Camera Until The End of The Meal Time **(Detect Face)**.
2. The system Shall request the User Enter QR Code .**(Enter QRcode)**
3. The system respond the Alert Error Sound if the users fail to enter QR code.(**Give Alert sound)**
4. The system shall Read The User QR Code and decrypt it.**(Read QR code and Dcrypt QR code)**.
5. The system Should check QR Code is real Meal Card QR Code or not.
6. The system Should check If the detected Face is the Same as the Face Associated With the Qr Code .
7. The system should check either the user has been Eaten or not. **(check the users status eaten or not)**.
8. The system recognize the as the user face couldn't associated with in The Qr Code Checked . it will reports users in the cheaters list.(**cheating with in others meal card)**.
9. The system shall enter user in cheater list if the user are cheating repeatedly .
10. the sytem shall generate reports how many students get cafeteria service day,month,year with in all meal time as well as break fast,launch and dinner time.

2.4.2 Non Functional Requirment

- **Usability:** The system allows easy to learn and easy to understand by which recognizing userface and match with the crosssponding Barcode .
- **Reliability:** The system provide correct information about users of currently detected face during meal time .
- **Performance:** The system user to respond by detectecting userface in minimal time frame.
- **Maintainablity:**The sytetem can mantain when ever there is error.
- **Extensiablity:** the system can extend in to large scale system with in the same scope.
- **Aviliablity:**The system is aviliable only in meal time of breakfast (12-2:00),lanch(5:00-7:30) and dinner(10:30-1:00).

2.5 UML Analysis Model

2.6 Usecase Diagram

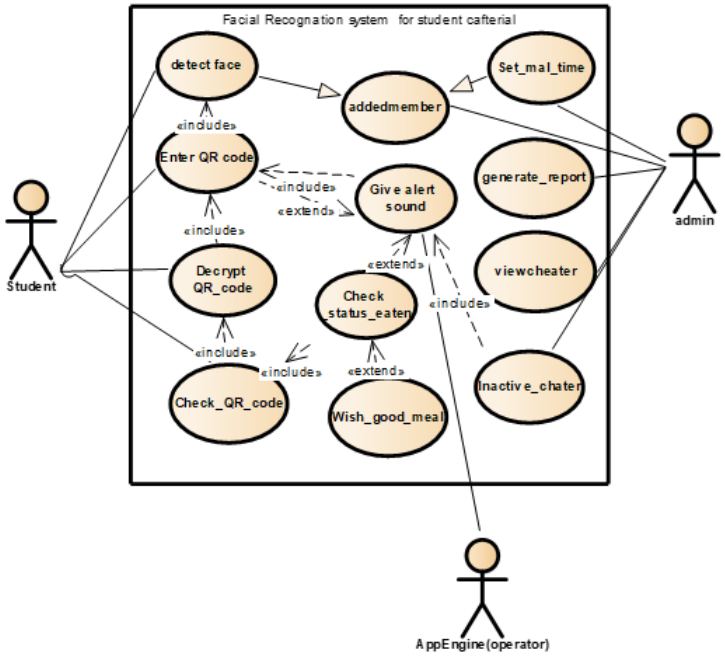

Figure 1: use case diagram for Student cafeteria recognition system

Future projects(with relative Logic)

1. Attandance system based on face recognation system(student,for emplyee in compus and for any organization off cumpus).
2. Attandance system based on fingure print(for any organization)
3. Laptop Id card system and entry exit system based on serial tracing and face recognaton mechanisim(for any organization).
4. GUI complete Events and Days left Counter.eg 100,50,25,10 day events release and event monitor.
5. Object Detection with full wrpper of face recognation special unnessary electronic materials in univeristy,hotels and others,out going books in libraryand lab equipments .
6. People counter and service checker in Bathar,hotels,univerity,library ,teater,class room ,cennima,stadium.

Suggesstion by
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