

Final Year Project Report
Teacher Assistance System



Project Advisor:
Miss Tayaba Anjum

Submitted By:
Syed Mohsin Raza
Saadullah Naeem
Hafiz Umer Farooq

Session
(2012-2017)

University of Management and Technology
C-II Johar Town Lahore Pakistan

Dedication

We are dedicating this work to our family, teachers and the people who taught us lessons of life. We will always appreciate all they have done in our lives.

We are also dedicating this project to our all faculty members, staff, Rector UMT, and specially our teachers who made us to create and show our skills in front of the world.

We are also thankful to SST Department for helping us to develop our technical skills.

Our Dean special thanks for him to show his interest and thanks for helping. We would never forget our Project Advisor (Miss TayabaAnjum) and Co-Advisor (Miss EmmanFarooq). She helped us a lot to create this project. Her role in this project is a vital role. There is no doubt that without their continuous support we could not have completed this process.

We also dedicate this work and give special thanks to our best friends for being there for us throughout the entire Bachelor in Computer Science program. All of you have been our best cheerleaders.

Final Approval

Panel of Examiners

- **Head of Department**
Department of Computer Science
UMT Lahore _____

- **Program Director (Final Year Projects)**
Department of Computer Science
UMT Lahore _____

- **Supervisor**
Department of Computer Science
UMT Lahore _____

- **Co-Supervisor**

Acknowledgment

A project like this is never the work of anyone alone. The contribution of many people, in their different ways, has made it possible. We would like to extend our appreciation to the following:

We would like to **Thank Allah** for the wisdom and perseverance that has been bestowed upon us during the whole project, and indeed, throughout our lives. We can do everything through him who gives us strength.

Yeah, this project would not have been possible without the participation of the subject. So, we thanks to all teachers of our department, who are very helping, they help us at every step in this project and make us capable to complete this project. All the faculty members are well educated and students friendly. So, thanks to all faculty members.

Special thanks to **Miss Tayaba Anjum**, our project adviser. Her support, advice throughout the project, as well as her pain taking effort towards our project is greatly appreciated. Indeed, without her effort we were unable to complete our project in time and as much accurate.

We also thank to **Miss EmmanFarooq** our project co-adviser. Without her guidance, we cannot come to know our mistakes that we might done. She not only underlines our mistakes but also guide us to solve them. She is very helping.

We would like to thanks our **Parents** too, for their unconditional support, both financially and emotionally throughout our degree.

Project Title

Teacher Assistance System (TAS)

Objective

To help teachers in any educational institute and save their time.

Undertaken by

Syed Mohsin Raza

SaadUllahNaeem

HafizUmerFarooq

Supervised by

Miss Tayaba Anjum

Starting Date

October 1, 2016

Completion Date

May 15, 2017

Tools Used

- Xcode
- Open CV
- LBPH algorithm
- Firebase
- Testing Tool (IPhone)
- Server

Operating System

IOS 7.0 and above

Plagairism Report

Abstract

An application that assist Teachers in marking attendance and their student's attendance by simple functions. This application will also give schedule of classes to teacher

The application has two parts one is the front end (iPhone) and the second is the server end (online firebase database). The front end is just for the iPhone in which first we capture the images of the user through camera while applying face detection algorithm in order to the detect the face, once we get the detected face we are going to save it to the online firebase database in the user account for which he had signup early.

The user is going to login in his account in order to use the app, after login he is going to recognize its face, but for the first time before the face recognition process he is going to asked to train his face recognizer.

The user is going to train the recognizer and during this process the images from the firebase database are going to download and saved in his face recognizer, after that he can recognize his face to mark attendance as soon as the attendance is marked the attendance is going to save in the real-time firebase database, but if the internet connection is not available the data is going to save in the cache and then upload automatically as soon as the internet service is available.

Teacher daily schedule and complete student information is going to sync from the firebase database, which is uploaded by our web portal.

REVISION CHART

Version	Primary Author(s)	Description of Version	Date Completed
Draft	All members	Information and requirement gathering	05-09-16
Preliminary	All members	Functional and non-functional requirements, project overview, system attributes, assumptions	18-09-16
Final	Syed Mohsin Raza Saadullah Naeem	Prototyping, design specifications, UML diagrams, Use cases, database design	17-10-16
Revision 1	Syed Mohsin Raza Saadullah Naeem	Revised draft, Prototyping, debugging errors, data flow diagrams	30-10-16
Revision 2	Syed Mohsin Raza Saadullah Naeem	Revised draft, non-functional requirements, system architecture diagram, data flow diagrams, class diagram	15-11-16
Revision 3	Saadullah Naeem Umar Farooq	Class diagram, test cases, user interface	30-11-16
Revision 4	Syed Mohsin Raza Saadullah Naeem	Testing, ER diagram	25-12-16
Revision 5	All members	System testing, bugs fixing	15-01-17
Revision 6	Syed Mohsin Raza Saadullah Naeem	Testing, User Interface	27-02-17
Revision 7	Saadullah Naeem	Diagrams enhancement	26-03-17
Revision 8	All members	Complete Testing	21-0-17
Revision 9	All members	Whole document revised	10-05-17

CONTENTS

CONTENTS.....	1
DEFINITIONS AND ACRONYMS.....	3
LIST OF FIGURES.....	4
LIST OF TABLES.....	5
1. INTRODUCTION	6
1.1 MOTIVATIONS.....	6
1.2 PROJECT OVERVIEW.....	ERROR! BOOKMARK NOT DEFINED.
1.3 PROBLEM STATEMENT	ERROR! BOOKMARK NOT DEFINED.
1.4 OBJECTIVES	ERROR! BOOKMARK NOT DEFINED.
2. DOMAIN ANALYSIS	ERROR! BOOKMARK NOT DEFINED.
2.1 CUSTOMER.....	ERROR! BOOKMARK NOT DEFINED.
2.2 STAKEHOLDERS.....	ERROR! BOOKMARK NOT DEFINED.
2.3 AFFECTED GROUPS WITH SOCIAL OR ECONOMIC IMPACT.....	ERROR! BOOKMARK NOT DEFINED.
2.4 DEPENDENCIES/ EXTERNAL SYSTEMS.....	ERROR! BOOKMARK NOT DEFINED.
2.5 REFERENCE DOCUMENTS.....	ERROR! BOOKMARK NOT DEFINED.
2.5.1 <i>Related Projects</i>	<i>Error! Bookmark not defined.</i>
3. REQUIREMENTS ANALYSIS.....	ERROR! BOOKMARK NOT DEFINED.
3.1 REQUIREMENTS.....	ERROR! BOOKMARK NOT DEFINED.
3.2 LIST OF ACTORS.....	ERROR! BOOKMARK NOT DEFINED.
3.3 LIST OF USE CASES.....	ERROR! BOOKMARK NOT DEFINED.
3.4 SYSTEM USE CASE DIAGRAM.....	ERROR! BOOKMARK NOT DEFINED.
3.5 EXTENDED USE CASES.....	ERROR! BOOKMARK NOT DEFINED.
3.6 USER INTERFACES (MOCK SCREENS).....	ERROR! BOOKMARK NOT DEFINED.
4. DATA FLOW DIAGRAM (OPTIONAL)	ERROR! BOOKMARK NOT DEFINED.
4.1 DATA FLOW DIAGRAM LEVEL 0	ERROR! BOOKMARK NOT DEFINED.
4.2 DATA FLOW DIAGRAM LEVEL 1	ERROR! BOOKMARK NOT DEFINED.
4.3 DATA FLOW DIAGRAM LEVEL 2	ERROR! BOOKMARK NOT DEFINED.
5. SYSTEM DESIGN	ERROR! BOOKMARK NOT DEFINED.
5.1 SYSTEM ARCHITECTURE DIAGRAM.....	ERROR! BOOKMARK NOT DEFINED.
5.2 MORE ENHANCED VIEW	ERROR! BOOKMARK NOT DEFINED.
5.3 CLASS DIAGRAM.....	ERROR! BOOKMARK NOT DEFINED.
5.4 SEQUENCE DIAGRAMS.....	ERROR! BOOKMARK NOT DEFINED.
5.5 DATA DICTIONARY.....	ERROR! BOOKMARK NOT DEFINED.
6. IMPLEMENTATION DETAILS	ERROR! BOOKMARK NOT DEFINED.
6.1 DEVELOPMENT SETUP	ERROR! BOOKMARK NOT DEFINED.
6.2 DEPLOYMENT SETUP.....	ERROR! BOOKMARK NOT DEFINED.
6.3 ALGORITHMS.....	ERROR! BOOKMARK NOT DEFINED.
6.3.1 <i>Face Detection</i>	<i>Error! Bookmark not defined.</i>
6.3.2 <i>Face Recognition</i>	<i>Error! Bookmark not defined.</i>
6.3.3 <i>Threshold</i>	<i>Error! Bookmark not defined.</i>
6.4 CONSTRAINTS.....	ERROR! BOOKMARK NOT DEFINED.
6.4.1 <i>Assumptions</i>	<i>Error! Bookmark not defined.</i>
6.4.2 <i>System constraints</i>	<i>Error! Bookmark not defined.</i>

7.	TESTING.....	ERROR! BOOKMARK NOT DEFINED.
7.1	EXTENDED TEST CASES	ERROR! BOOKMARK NOT DEFINED.
7.1.1	Train Images.....	<i>Error! Bookmark not defined.</i>
7.1.2	User Login to application.....	<i>Error! Bookmark not defined.</i>
7.1.3	Recognize the image for attendance.....	<i>Error! Bookmark not defined.</i>
7.1.4	Add data to the server.....	<i>Error! Bookmark not defined.</i>
7.2	CODE SNIPPETS.....	ERROR! BOOKMARK NOT DEFINED.
7.3	TRACEABILITY MATRIX	ERROR! BOOKMARK NOT DEFINED.
7.3.1	RID vs UCID (requirements vs use cases).....	<i>Error! Bookmark not defined.</i>
7.3.2	Prototypes (RID vs PID).....	<i>Error! Bookmark not defined.</i>
7.3.3	Test Cases (RID vs TID).....	<i>Error! Bookmark not defined.</i>
7.3.4	Coverage (UCID vs TID).....	<i>Error! Bookmark not defined.</i>
8.	RESULTS/OUTPUT/STATISTICS.....	ERROR! BOOKMARK NOT DEFINED.
8.1	% COMPLETION	ERROR! BOOKMARK NOT DEFINED.
8.2	% ACCURACY.....	ERROR! BOOKMARK NOT DEFINED.
8.3	% CORRECTNESS	ERROR! BOOKMARK NOT DEFINED.
9.	CONCLUSION.....	ERROR! BOOKMARK NOT DEFINED.
10.	FUTURE WORK.....	ERROR! BOOKMARK NOT DEFINED.
11.	BIBLIOGRAPHY.....	ERROR! BOOKMARK NOT DEFINED.
12.	APPENDIX	ERROR! BOOKMARK NOT DEFINED.
12.1	GLOSSARY OF TERMS.....	ERROR! BOOKMARK NOT DEFINED.

Definitions and Acronyms

Acronym	Definition
UMT	University of Management and Technology
SST	School of Science and Technology
TAS	Teacher Assistant System
IOS	iPhone Operating System
LBPH	Local Binary Patterns Histograms

Table 1: Table of acronyms and definitions

List of Figures

Figure 1 : Frontend Use Case Diagram	Error! Bookmark not defined.
Figure 2 : Server System Use Case Diagram	Error! Bookmark not defined.
Prototype 1 : (P1) Server Login.....	Error! Bookmark not defined.
Prototype 2 : (P2) Insert the data of the student	Error! Bookmark not defined.
Prototype 3 : (P3) Server with data and schedule.....	Error! Bookmark not defined.
Prototype 4 : (P4) After the Month server report	Error! Bookmark not defined.
Prototype 5 : (P5) Application Login	Error! Bookmark not defined.
Prototype 6 : (P6) Main menu of the application	Error! Bookmark not defined.
Prototype 7 : (P7) Train Image.....	Error! Bookmark not defined.
Prototype 8 : (P8) Teacher Attendance.....	Error! Bookmark not defined.
Prototype 9 : (P9) Student Attendance Screen	Error! Bookmark not defined.
Prototype 10 : (P10) Classes Schedule	Error! Bookmark not defined.
Figure 3 : Data Flow Diagram Level 0.....	Error! Bookmark not defined.
Figure 4 : Data Flow Diagram Level 1.....	Error! Bookmark not defined.
Figure 5 : Data Flow Diagram Level 2.....	Error! Bookmark not defined.
Figure 6 : System Architecture.....	Error! Bookmark not defined.
Figure 7 : Enhanced System Architecture	Error! Bookmark not defined.
Figure 8 : Class Diagram.....	Error! Bookmark not defined.
Figure 9 : Login Sequence Diagram.....	Error! Bookmark not defined.
Figure 10 : Student Registration Sequence Diagram.....	Error! Bookmark not defined.
Figure 11 : Enrollment Sequence Diagram	Error! Bookmark not defined.
Figure 12 : Instructor Attendance Sequence Diagram.....	Error! Bookmark not defined.
Figure 13 : Student Attendance Sequence Diagram.....	Error! Bookmark not defined.
Figure 14 : Instructor Schedule Sequence Diagram	Error! Bookmark not defined.

List of Tables

Table 1: Table of acronyms and definitions	3
Table 2 : List Of Stakeholders.....	Error! Bookmark not defined.

1. INTRODUCTION

Our project is an IOS and Web based Teacher Assistance System which is developed using Open CV, XCode and Microsoft Visual Studio.

1.1 Motivations

In our university life, we realize that Students and Teachers are facing many problems during their daily tasks. Teachers has to spend much of their time in managing their student's attendance and academic record. Students faced difficulties during course registration and getting their academic progress. For weeks after starting a new session teachers could not get the updated list of students enrolled in their courses. Because of daily changing class schedules teachers has to spend reasonable amount of time just to know about their daily class schedules. Teacher have to spend the valuable time of lecture in just calling out the names of students and marking their attendance. So mainly these factors motivate us to develop an administrative and management structure making daily management more robust and time efficient.