

# EduSys KickOff Document

## Description

EduSys is a web application that helps lecturers with taking attendance by face recognition through cameras in the classroom. It also gather statistics of students' interest to lecture by detecting where individuals sit in the class.

EduSys shows statistics it gathered in three different dashboards: Student, Lecturer and Administration. Student are able to see their interest and attendance to certain lectures, and they are able to enter examination informations so that EduSys can generate future interest areas according to their success, attendance and interest to certain course combinations. Also, EduSys will notify students with their attendance percentage.

Lecturers are able to see daily, weekly, monthly and semesterly statistics of attendance and interest of student to their certain courses so that it will be easy for them to understand which teaching methods are effective throughout the semester.

Administration is given a proper feedback about lecturers and attendance to their courses rather than evaluation surveys completed by students.

## Workpackages (Master feature list)

WP#	Term	WP title	Estimated number of man-months
1	491	Architectural Design	2
1	491	Completing installation of IP camera	4
2	491	Detection of faces of students	3
3	491	Recognition of faces of students	8
4	492	Generating interest information about individuals	3
5	492	Generating attendance information about individuals	3
6	492	Generating future interest areas	2
7	492	Student Dashboard	4
8	492	Lecturer Dashboard	3
9	492	Administration Dashboard	3
		Total:	36

### Workpackages (Bonus feature list)

BWP#	Term	BWP title	Estimated number of man-months
1	492	Facial emotional recognition of students.	4
2	492	Gender and age estimation means of students.	4
		Total:	8

### Detailed Descriptions of High-Level Workpackages

#### WP1 - (Architectural Design)

- 1- Confirming developing environments for the project.
- 2- Deciding which architectural design we will be following.
- 3- Deciding which open source libraries, ready-to-use materials we will be using.

#### WP2 - (Completing installation of IP camera)

- 1- Getting one (maybe two according to risk assessment) IP camera which connected to a network.
- 2- Setting up camera to proper angles.
- 3- Installation of camera software.
- 4- Learning its software.
- 5- Getting data from the camera and process this data frame by frame.

#### WP3 - (Detection of faces of students)

- 1- Finding proper algorithms to detect faces in frames coming from IP camera.
- 2- Implementing algorithms.
- 3- Testing with different variable changes. (Position of students, light etc.)

#### WP4 - (Recognition of faces of students)

- 1- Generating a dataset of faces of students photographed from different angles with different light.
- 2- Finding proper algorithms to train data of faces in frames coming from IP camera.
- 3- Finding proper algorithms to detect resemblance queried face and trained data.
- 4- Implementing those algorithms.
- 5- Testing with different variable changes. (Position of students, light etc.)

#### WP5 - (Generating interest information about individuals)

- 1- Generating data of where individuals sit in the classroom according to face recognition in WP3.

2- Keeping data in server databases.

#### **WP6 - (Generating attendance information about individuals)**

1- Generating data of if individuals are in the classroom according to face recognition in WP3.

2- Keeping data in server databases.

#### **WP7 - (Generating future interest areas)**

1- Defining a graph where combination of certain courses in our department leads to certain areas of interest with collaboration of academics in department.

2- Defining an algorithm that includes data stored in WP4 and WP5 and also students' examination information to generate future areas of interest defined by graph in Item 1.

#### **WP8 - (Student Dashboard)**

1- Implementing authentication Sign Up and Log In features to student dashboard.

2- Student Dashboard will include following.

a- Daily, weekly, monthly and semesterly attendance statistics of students in certain courses with graphics.

b- Notification system that notifies student if they are going to fail from attendance with their current attendance ratio.

c- Visualization of the graph in WP6 and coloring it with statistics of students leading to certain areas such as Bioinformatics, Computer Vision etc.

#### **WP9 - (Lecturer Dashboard)**

1- Implementing authentication Sign Up and Log In features to lecturer dashboard.

2- Lecturer Dashboard will include following.

a- Daily, weekly, monthly and semesterly attendance statistics of students in certain courses of lecturers with graphics.

b- Daily, weekly, monthly and semesterly interest statistics of students to certain courses of lecturers with graphics.

c- Heat map of distribution of students in the seats in certain courses' sections.

#### **WP10 - (Administration Dashboard)**

1- Implementing authentication Sign Up and Log In features to administration dashboard.

2- Administrative Dashboard will include following.

a- Daily, weekly, monthly and semesterly attendance statistics of students to courses of certain lecturers with graphics.

b- Daily, weekly, monthly and semesterly interest statistics of students to courses of certain lecturers with graphics.

c- Heat map of distribution of students in the seats in certain courses' sections.

d- Proper semester report about lecturers.

#### **Detailed Descriptions of Bonus Workpackages**

### **BWP1 - (Facial emotional recognition of students)**

- 1- Finding proper algorithms to detect facial emotions of students.
- 2- Implementing those algorithms.
- 3- Testing with different variable changes. (Position of students, light etc.)

### **BWP2 - (Gender and age estimation means of students)**

- 1- Finding proper algorithms to detect genders and ages of students.
- 2- Implementing those algorithms.
- 3- Testing with different variable changes. (Position of students, light etc.)
- 4- Generating age and gender mean statistics of lectures.

### **Risk Assessment**

<b>Risk #</b>	<b>Description</b>	<b>Possible Solution(s)</b>
1	Not being able to detect/recognize all faces in the classroom.	Giving an option to lecturers to edit attendance list of the system.
2	Not being able to distinguish two student faces.	Looking for previous statistics of certain student and generate a probability.