

Embedded Systems, Winter term 2018
Project Description
Deadline: 6/12/2018

Your project should be done using an Arduino Uno or Mega board and the Arduino IDE.

1 Enabling Individuals

This cluster contains projects that aim at enabling and engaging individuals. The bigger picture is to provide environments that could be usable and accessible by all people

1.1 Project 1: Communication between individuals with hearing and sight impairments

A person with a hearing impairment can see, text and use sign language whereas, a person with sight impairment can talk and listen. The aim of this project is to implement a system that could enable communication between individuals with hearing impairment and individuals with sight impairment.

The inputs would thus be provided by voice or text by one party and converted to another form that is understandable by the other party.

Responsible TA: Eng. Mariam Osama Abo El Nour

1.2 Project 2: Gesture-Controlled Car

The aim of this project is to provide cars and wheelchairs that are easier to control. Instead of any needed effort, the car should be controlled using gestures.

The system should thus be able to receive the readings from the hand (and an accelerometer) and act upon them. The car should also automatically avoid obstacles without any need of extra gestures/control.

Responsible TA: Eng. Mariam Osama Abo El Nour

2 Smart Environments

Embedded Systems could be employed to make our places smarter. This includes homes and classrooms. The projects in this cluster aims at embedding smart elements into classrooms.

2.1 Project 1: Smart Attendance

This system aims at automating the attendance procedure. The door is thus controlled through IDs. The attendance of the student is only counted if they attended at least 75% of the class. The system is thus able to keep track of every time a student enters and leaves the classrooms since the door also opens internally through the ID number. In case of a fire, the door opens automatically without the need of an ID.

The class automatically starts when the instructor enters and ends when they leave.

On an LCD, the number of students currently in class should be displayed.

Responsible TA: Eng. Walid El Hefny

2.2 Project 2: Smart Classroom

This project aims at making classrooms smarter. The system should enable the display of the number of students, the number of free desks and their locations. Lights are controlled according to the seating map of the students. In case of an exam, the classroom enters a special mode where:

- All lights are on
- The teacher enters start time and duration
- A buzzer informs the students at the end of time
- The remaining time is shown on LCD

Responsible TA: Eng. Walid El Hefny

Preferences

You can enter your preferences through: <https://goo.gl/forms/sgy31nMzeYQYogoV2>. The deadline for choosing preferences is Tuesday 13/11/2018 at 9:00 a.m. We will try to assign you to the nearest project to your preference list. In case of ties, we will use first-come first-served.