IOWA STATE UNIVERSITY
Department of Electrical and Computer Engineering

Senior Design Project Proposal Form

Client/Company/Organization: Mohamed Selim

Submitter Name: Mohamed Selim **Email:** myoussef@iastate.edu

Project Contact: **Email:**

Project Title:

Designing and Implementing an Automated Team Attendance Tool: A Campus-Wide Solution for TBL Classes

Project Abstract:

No doubt, Team-Based Learning (TBL) positively influenced attendance in the classroom. However, teams are still suffering from absenteeism. Although a handful of attendance tools exist, none of these tools is adapted to the team-based classes, besides, none of them records the attendance without any interaction from the instructor/student. Moreover, these tools are consuming from 2 to 3 minutes from the class time, which will sum up over the semester to 135 minutes in the worst case. The proposed tool will record attendance at zero time.

The main idea is to automate the attendance of any team-based/active learning classroom given that the team assignments are permanent (if a student is assigned to group 5 s/he will be with group 5 for the whole semester) and their seating map for each team is permanent over the semester (for example team 5 is assigned 6 seats which are in a permanent location but it doesn't matter who from team 5 will set on which of the 6 seats since we are concerned with team attendance, not individual attendance).

The idea is based on using a fixed camera and a software algorithm where the input to the algorithm will be the classroom's map and the teams' map (which team is setting where). The algorithm will work on identifying the attendance of each team. For example, Team 1 is having 6 members (all team members are present), Team 2 is having 5 members (one team member is absent)... etc.

Expected Deliverables:

The project plan is to design the software during the fall semester. By the end of the fall semester, an initial version of the software is supposed to be ready (to be used with an ideal class arrangement). Then during the spring semester, the students will develop the full version and optimize it with the hardware then use the automated tool to capture the attendance of an actual class.

Deliverables: the automated attendance tool.

Specialized Resources Provided by Client:

Raspberry pi + Camera

Anticipated Cost: **Financial Resources Provided by Client:** N/A

Preferred Students for the Project:

- ☑ Electrical Engineering
- ☑ Computer Engineering
- ☑ Software Engineering

Other Special Skills: Python, basic knowledge object detection

☐ Cyber Security Engineering
☐ Other:

Anticipated Client Interaction (estimate):

☑ 1 meeting per week
  ☑ In person, ☐ Over the phone, ☐ Web / video conferencing
☐ 1 meeting per month
  ☐ In person, ☐ Over the phone, ☐ Web / video conferencing
☐ 2 or more meetings per month
  ☐ In person, ☐ Over the phone, ☐ Web / video conferencing
☐ 1 meeting per semester
  ☐ In person, ☐ Over the phone, ☐ Web / video conferencing

Meeting ABET Criteria

Please rate the following statements as they relate to your proposed project:

	0 – Not at all	*1 – A Little*	*2 – Somewhat*	*3 – A Lot*	*4 – Completely*
On this project, students will need to apply knowledge of mathematics, science, and engineering	☐ 0	☐ 1	☐ 2	☑ 3	☐ 4
This project gives students an opportunity to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability	☐ 0	☐ 1	☐ 2	☐ 3	☑ 4
This project involves students from a variety of programs, i.e., CprE, EE, and SE	☐ 0	☐ 1	☐ 2	☑ 3	☐ 4
This project requires students to identify, formulate, and solve engineering problems	☐ 0	☐ 1	☐ 2	☐ 3	☑ 4
This project gives students an opportunity to use the techniques, skills, and modern engineering tools necessary for engineering practice	☐ 0	☐ 1	☐ 2	☐ 3	☑ 4

Project Approval – *for use by ECpE Senior Design Committee*

☑ Approved: sddec20-proj028
☐ Project Assigned: _____
☐ Advisor(s) Assigned: _____
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