

# LAT<sub>E</sub>X Proposal for Computer Vision

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## Abstract

Sam This Computer Vision project proposal will contain problem statement and importance, plan for data sources, and the computer vision algorithm to be used in this project.

## 1. Introduction

Attendance is a vital part of a students success in any course, especially in graduate level education, however enforcing and keeping records of a student's attendance is not always possible because of time and resource. In this project proposal will will lay out a system that will allow students to check in and out of a classroom using facial recognition.

## 2. Problem Statement

Attendance enforcement and record keeping in the class room is often overlooked because of added time and resources. Additionally, the COVID-19 pandemic has made it difficult to enforce attendance in the classroom. In this project, we will develop a system that will allow students to check in and out of a classroom using face recognition.

## 3. Data

1. The data for this project will be collected from the University of North Carolina's Canvas API (Will use Murtadha's Account) to fetch the number of students in the Computer Vision course. This information will be stored to be references to give a percentage of students attending.  
2. The dataset that will be used to train our model is the [Faces in the Wild \(LFW\)](#) dataset. This dataset contains more than 13,000 images of faces collected from the web. Each face has been labeled with the name of the person pictured. 1680 of the people pictured have two or more

distinct photos in the dataset. The only constraint on these faces is that they were detected by the Viola-Jones face detector.

3. Images of the students in the class will be collected using a webcam. The images will be taken in the classroom and will be used to train the model to recognize the students in the class.

The dataset used to test the model consists of photographs taken by group members during each class session. These photos were captured with the consent of the participants to record attendance for the day. Additionally, a small amount subset of a wild dataset will be incorporated as supplementary learning material.

Our approach involves training the model on a portion of the wild dataset to help it recognize and understand human faces. Subsequently, we will use our own images as test data to assess whether the model has been trained effectively. The primary objective is to determine the number of human faces in these images by performing face detection.

The dataset will be split into two parts: training and testing. The training dataset will be used to train the model to recognize the faces of the students in the class. The testing dataset will be used to test the model's accuracy.

The training dataset will consist of 80% of the images in the dataset. The testing dataset will consist of the remaining 20% of the images in the dataset.

asdsad

## 4. Methodology & Computer Vision Algorithm

### 4.1. Methodology

1. Train a model to recognize faces using the LFW dataset
2. Use the trained model to recognize the students in the class.
3. Use the Canvas API to fetch the number of students in

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066 the class.  
 067 4. Compare the number of students in the class to the  
 068 number of students recognized by the model to get a  
 069 percentage of students in the class.  
 070 5. Log the percentages and present them in a graph to  
 071 provide a visual representation of the attendance in the  
 072 class.

073  
 074 The model will be trained using the LFW dataset (Partially).  
 075 The model will be used to recognize the students in  
 076 the class. The model will be able to recognize the students  
 077 in the class and log the time they entered and exited the  
 078 classroom. The model will also be able to identify the  
 079 number of students in an image and cross-reference it with  
 080 Canvas's people table (number of students) to provide a  
 081 percentage of students in the classroom. The percentages  
 082 will be logged and presented in a graph to provide a visual  
 083 representation of the attendance in the class.  
 084

## 085 4.2. Computer Vision Algorithm

086 Using YOLO [1], a neural network for object detection, we  
 087 will train a model to recognize faces. The model will be  
 088 trained using the LFW dataset. The model will be used to  
 089 recognize the students in the class. The model will be able  
 090 to recognize the students in the class and log the time they  
 091 entered and exited the classroom. The model will also be  
 092 able to identify the number of students in an image and  
 093 cross-reference it with Canvas's people table (number of  
 094 students) to provide a percentage of students in the class-  
 095 room. The percentages will be logged and presented in a  
 096 graph to provide a visual representation of the attendance in  
 097 the class.  
 098

## 099 5. Team



100 101 **Murtadha Marzouq**  
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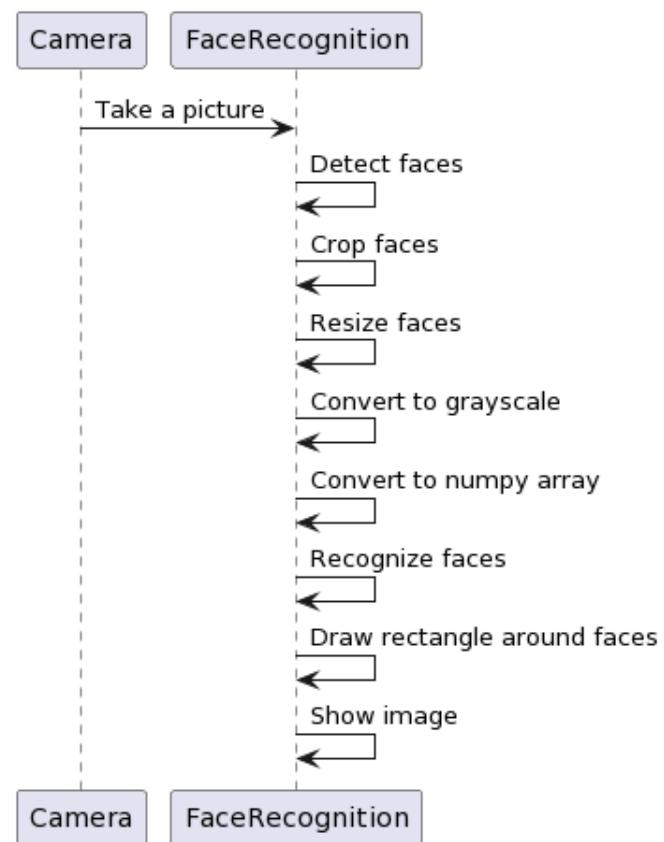
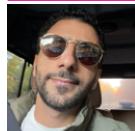


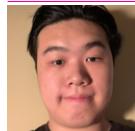
Figure 1. Flowchart of the system



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110  
 111 **Yuepei Yu**  
[Resume Link](#)

112 This team had been build with the following fellowship in  
 113 minds:

1. Liberté, Egalité, Fraternité
2. Diversity and Inclusion

114  
 115  
 116

117  
 118

119      3. Teamwork  
120      4. Respect  
121      5. Integrity  
122

123      **6. Results**

124      **7. Conclusion**

125      **References**

126 [1] Awais Adnan Misbah Ahmad, Imran Ahmed. Overhead view  
127      person detection using yolo. *IEEE*, pages 0627–33, 2019. 2