Problem

A common problem which professors and students face in IIT Madras is large batch strength due to which a lot of valuable class time is lost in manually taking attendance. Additionally there is always threat of damage to physical records.

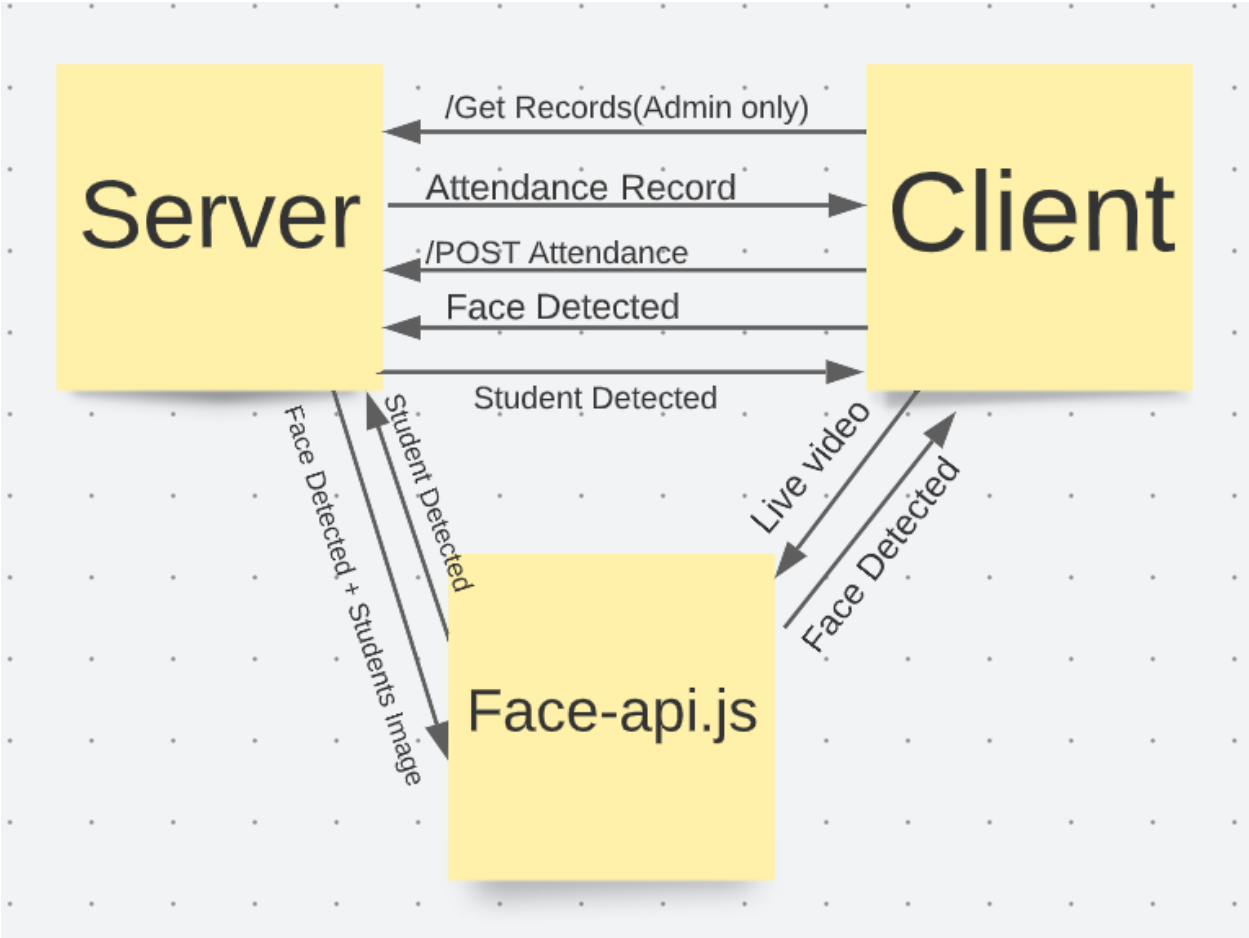
Proposed Solution

I built an AI Based Attendance System which uses face-api.js to detect faces and then match it with images of students stored in database to give out best or the closest match. Face-api.js is a javaScript face recognition API for the browser and nodejs implemented on top of tensorflow.js core

Advantages

- Saves class time as it can detect and store attendance very fast
- Reduces risk of loss of record
- Eliminates any type of human error
- Easy to manage records
- New features like sharing of lecture notes, important notices can be added

System Design



Frontend:

1. Face detection models for face-api.js are loaded
2. As soon as a face is detected a post request is made to the server with detections
3. Post request returns the name of the person as a response which is then displayed in the frontend
4. Once the user confirms his name a post request is send to server with his details and timestamp

Backend:

- I am using MONGODB in the backend because we can scale non-sql database horizontally very easily.
- As the schema of MONGODB is dynamic in nature we can add new features quickly.
- MONGODB is also quite cost effective

Challenges Faced

- Unfortunately due to an internal error in face-api.js, I was not able to use face-api.js in the backend with nodejs(still trying to find a workaround). Therefore i had to use it only in client side.
- Using face-api.js in the client side for all the request can make client side rendering costly
- It also causes new security and privacy issues