



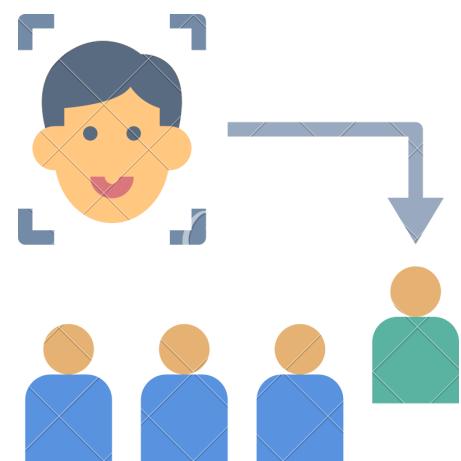
AUTOMATIC ATTENDANCE SYSTEM USING A GROUP IMAGE.



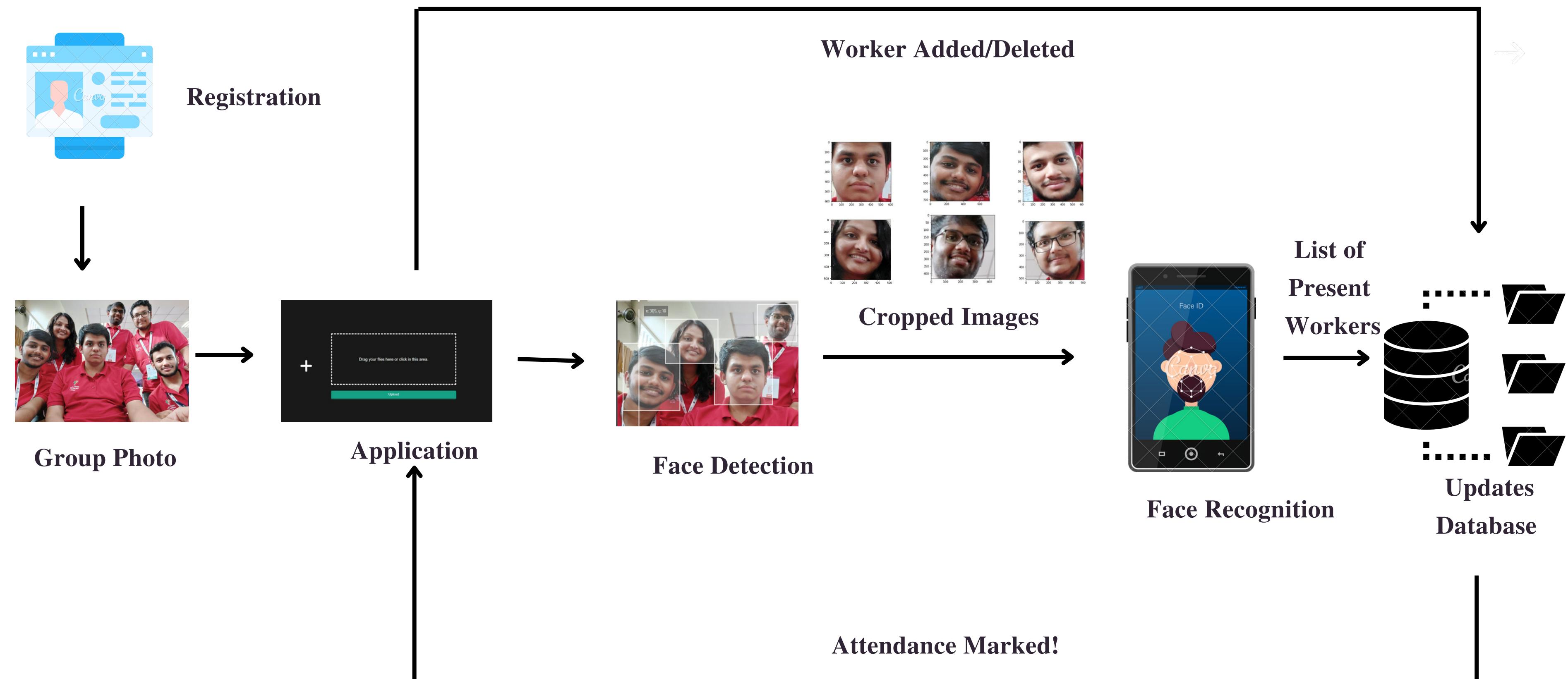
Why is there a need for a digital solution?

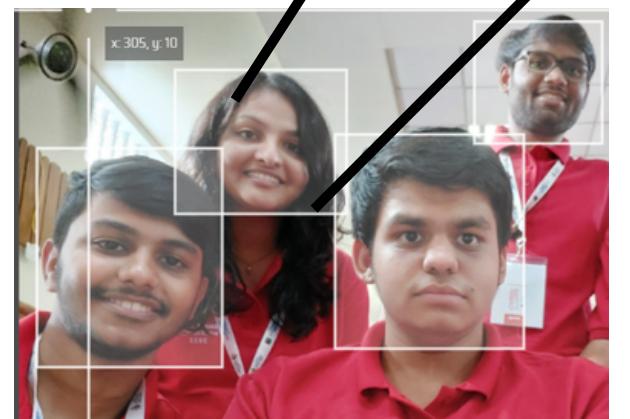
- Difficulty in manually keeping track of attendance.
- More time consuming and prone to human errors.
- Lack of secure identification of laborers.
- Deployment of any hardware in rural area for automation is not feasible and not cost effective.

The problem statement requires us to develop a robust system for marking attendance of the MGNREGA beneficiaries from their group photo using face recognition mechanism.

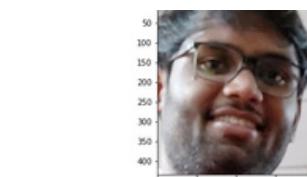
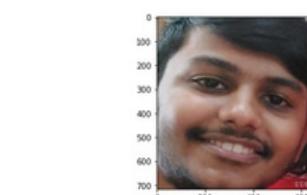


Process Flow:





Input Group
Photo



Detected Faces

```
✓ face_embedding: Array
  0: -0.19177965819835663
  1: 0.10632359236478806
  2: 0.08539555966854095
  3: -0.06199772655963898
  4: -0.08411846309900284
  5: 0.006422426551580429
  6: -0.0017616711556911469
```

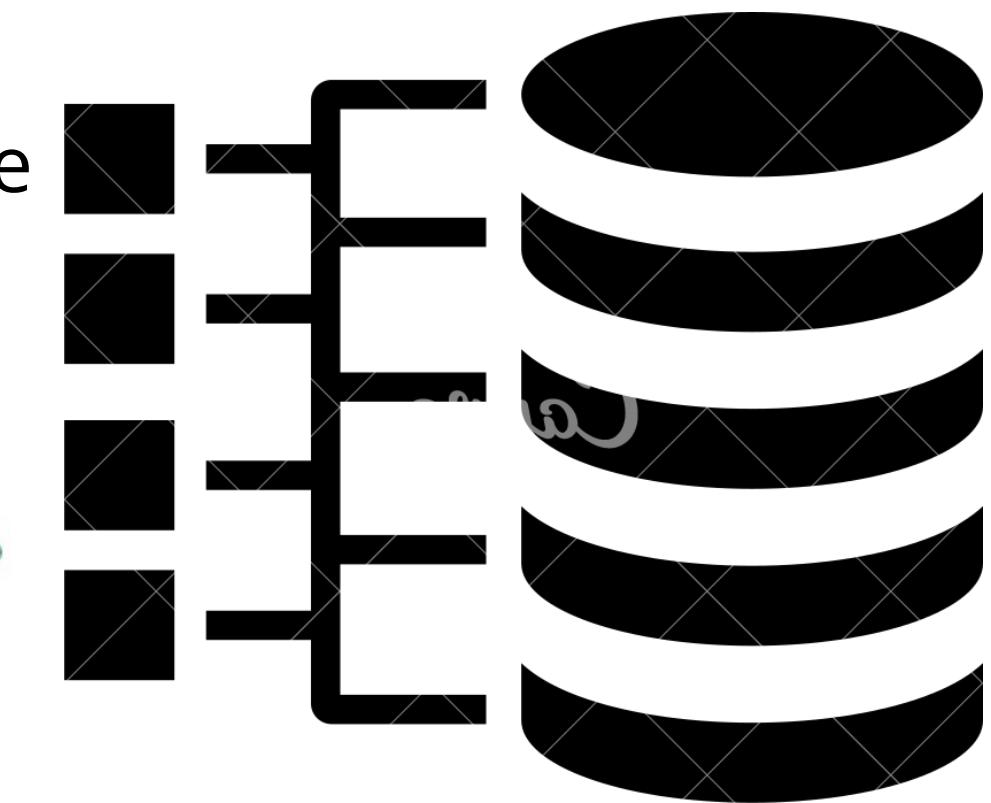
Embeddings
Generated

Comparison of Embeddings using cosine distance.



Bansi Shelke

```
✓ face_embedding: Array
  0: -0.19177965819835663
  1: 0.10632359236478806
  2: 0.08539555966854095
  3: -0.06199772655963898
  4: -0.08411846309900284
  5: 0.006422426551580429
  6: -0.0017616711556911469
```



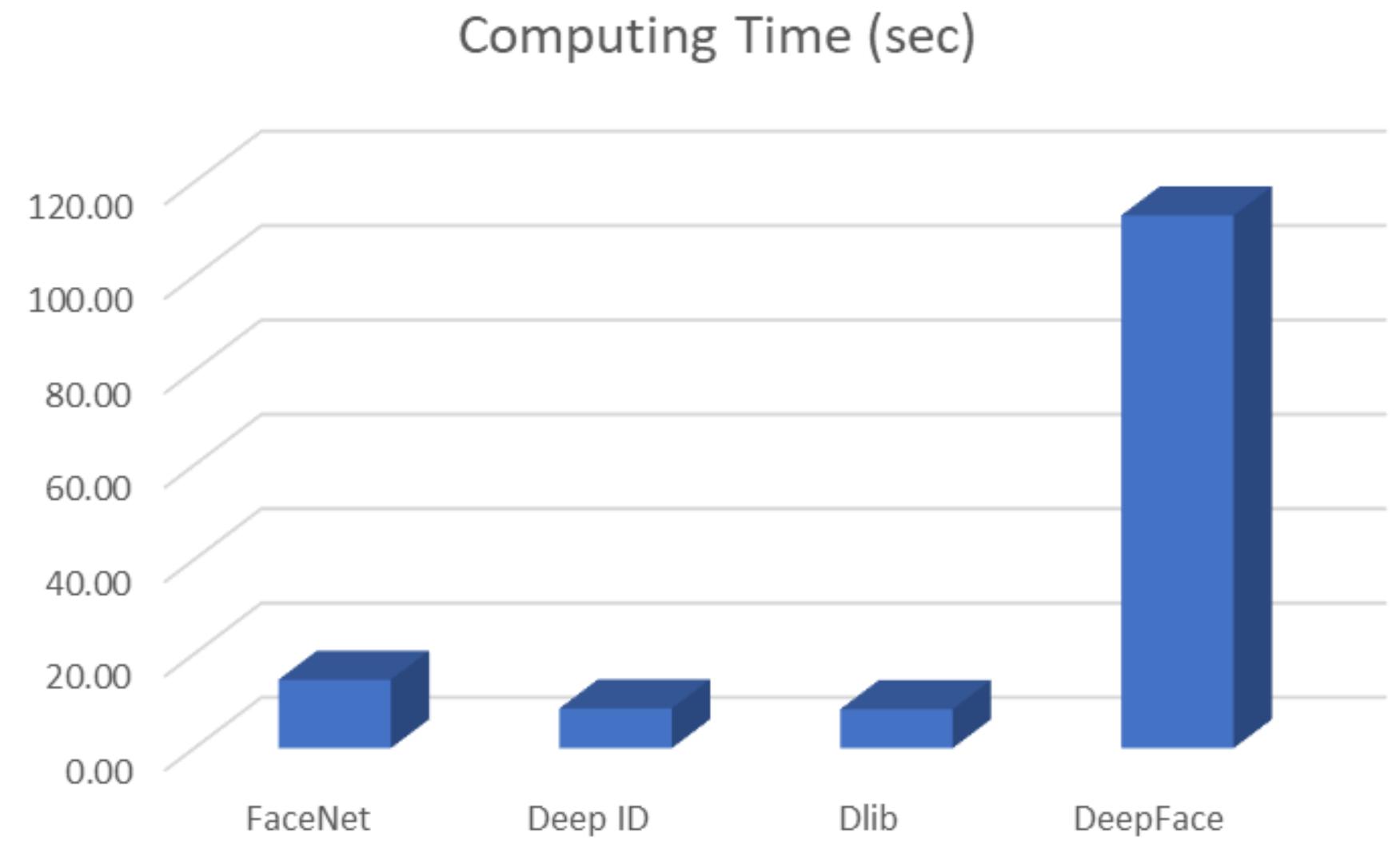
Embeddings Stored in
Database

Selection of Model:

For Recognition

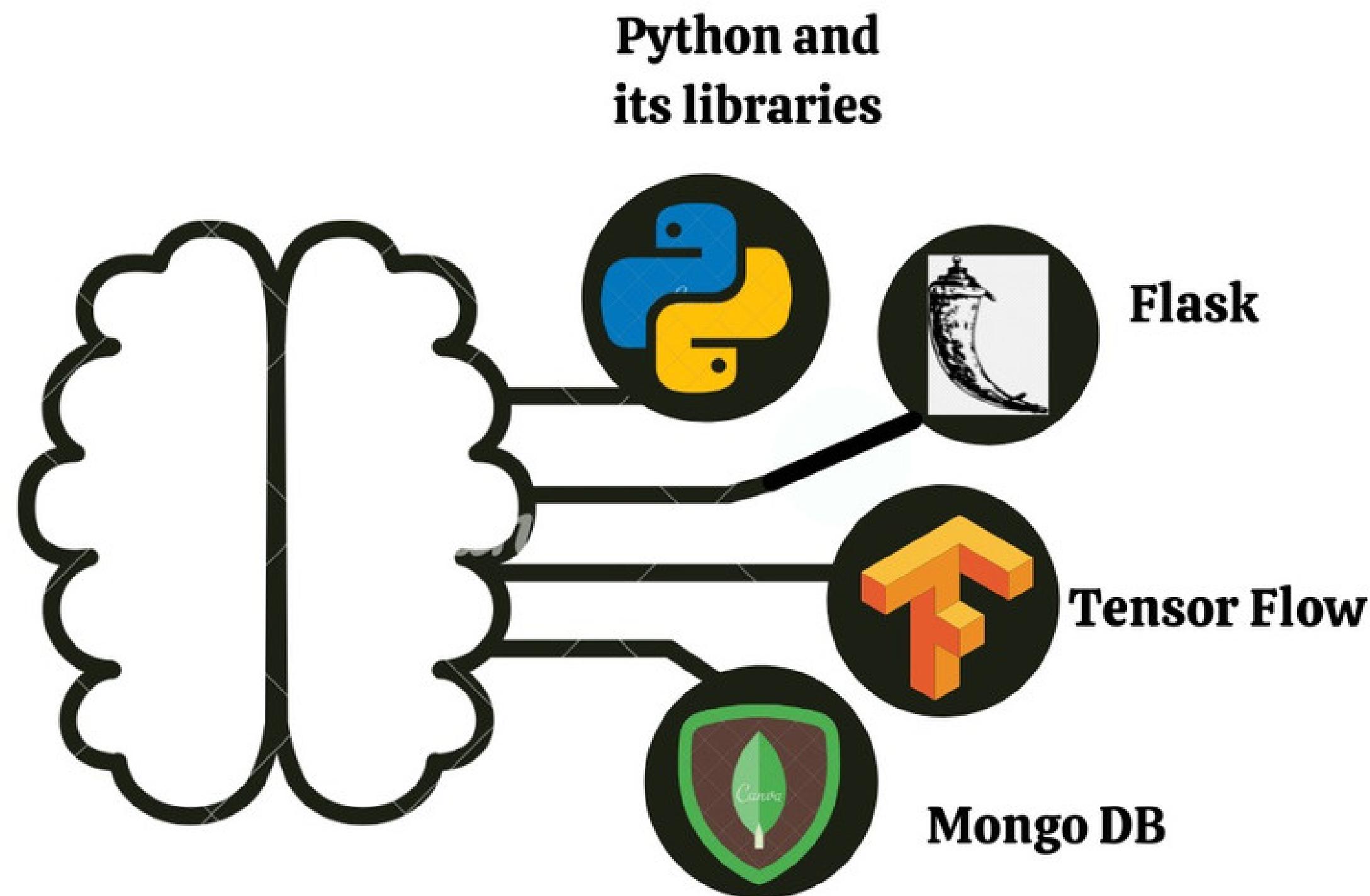
Face Recognition	Computing Time (sec)
Using Cosine Similarity	0.0012 secs
Using XGBoost Classifier	0.03 secs

For Generating Embeddings



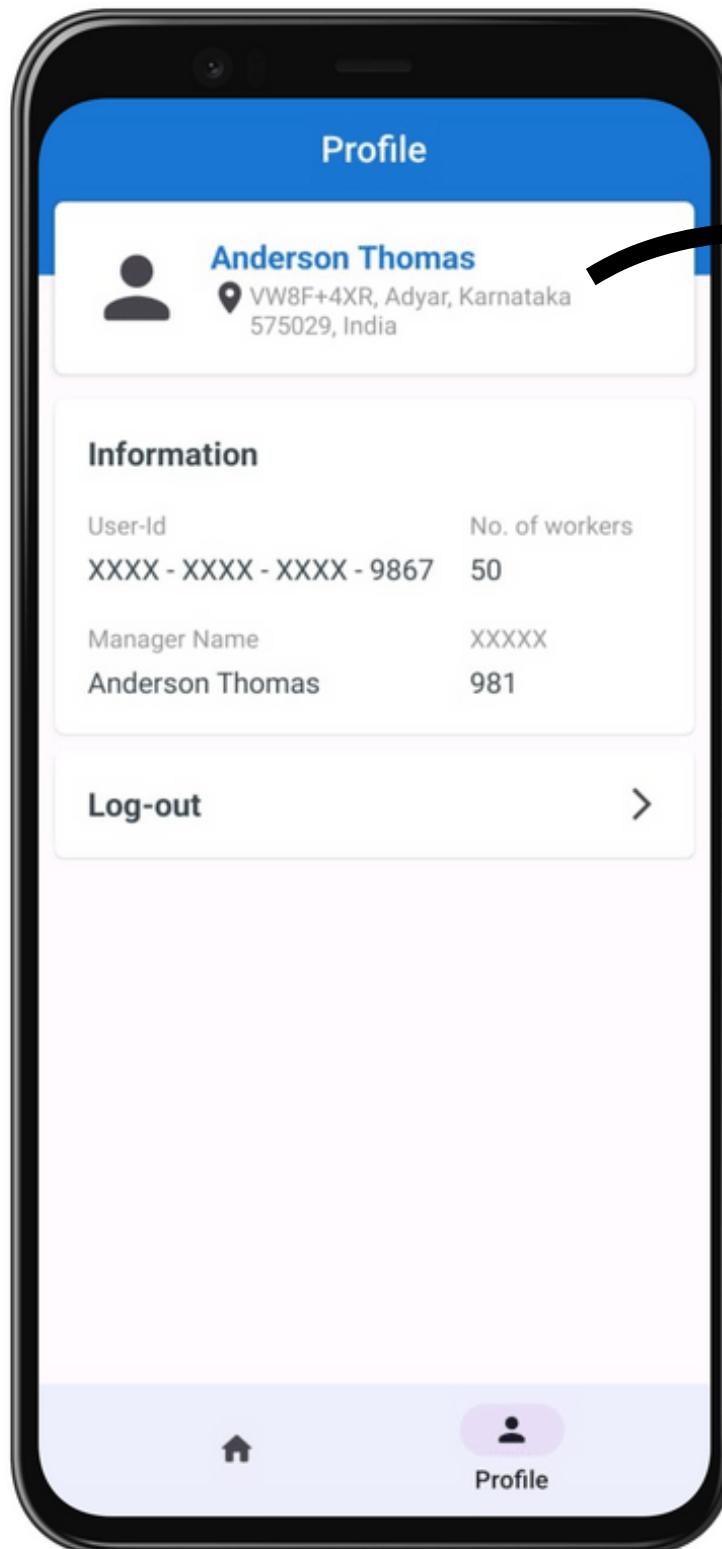
Models for Generating Face Embeddings	Computing Time (sec)
FaceNet	14.53
Deep ID	8.44
Dlib	8.28
DeepFace	112.94

Tech Stack:

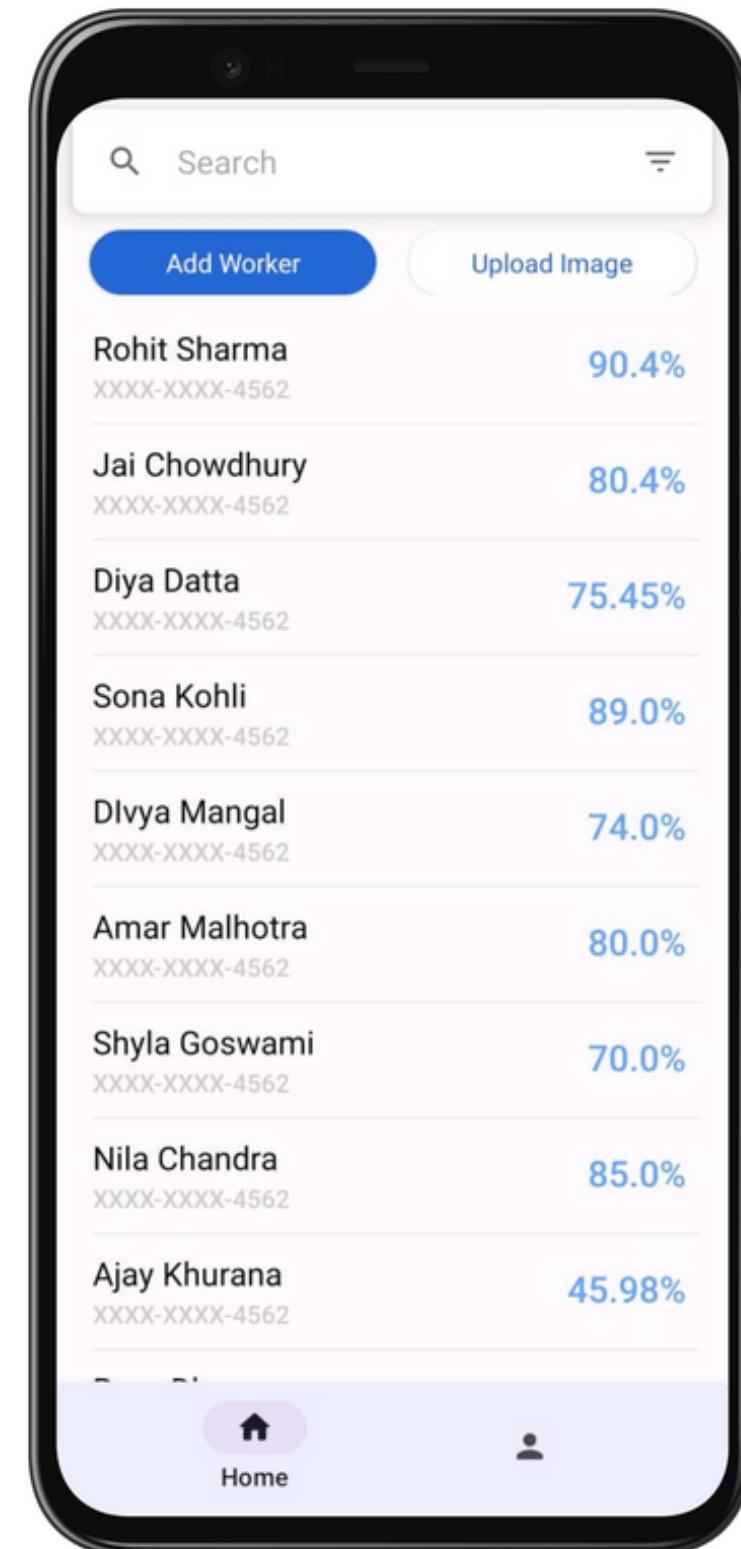


Our Applications:

Android Application:

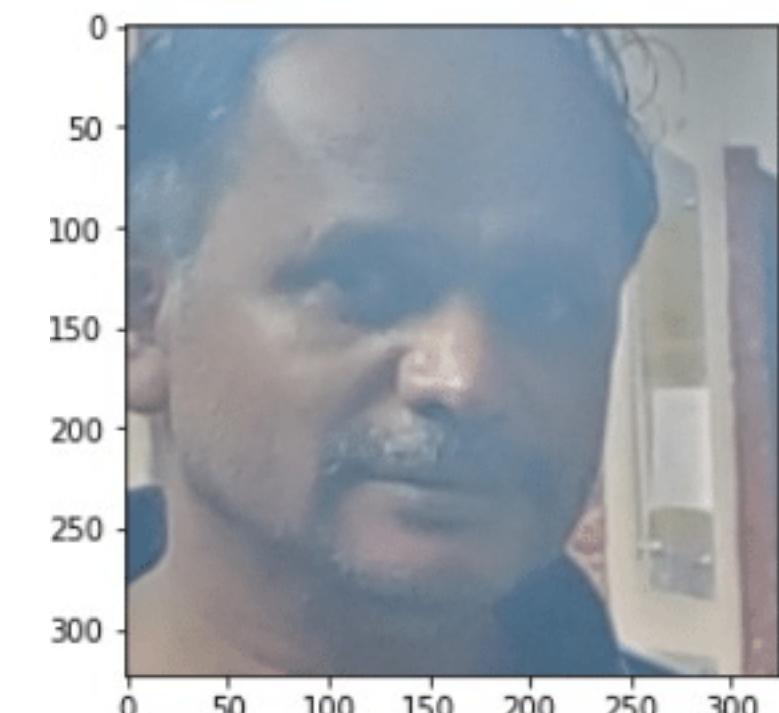
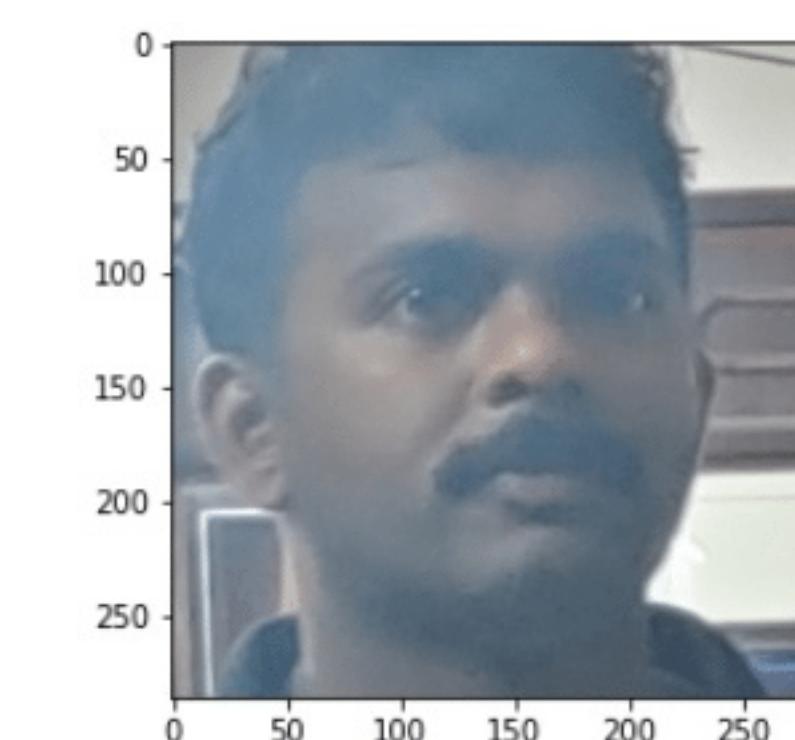
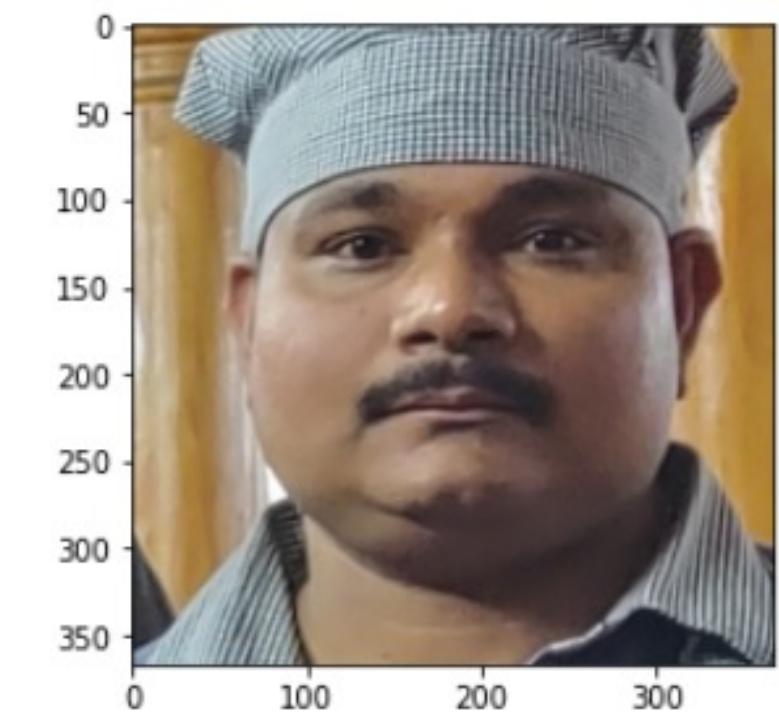
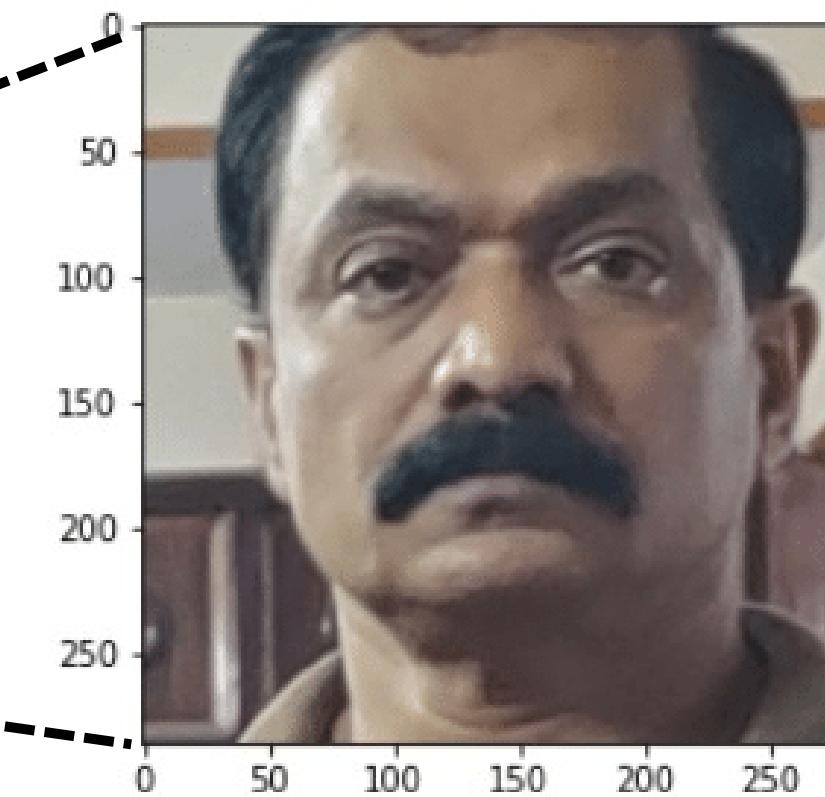


Live location monitoring
while marking attendance.

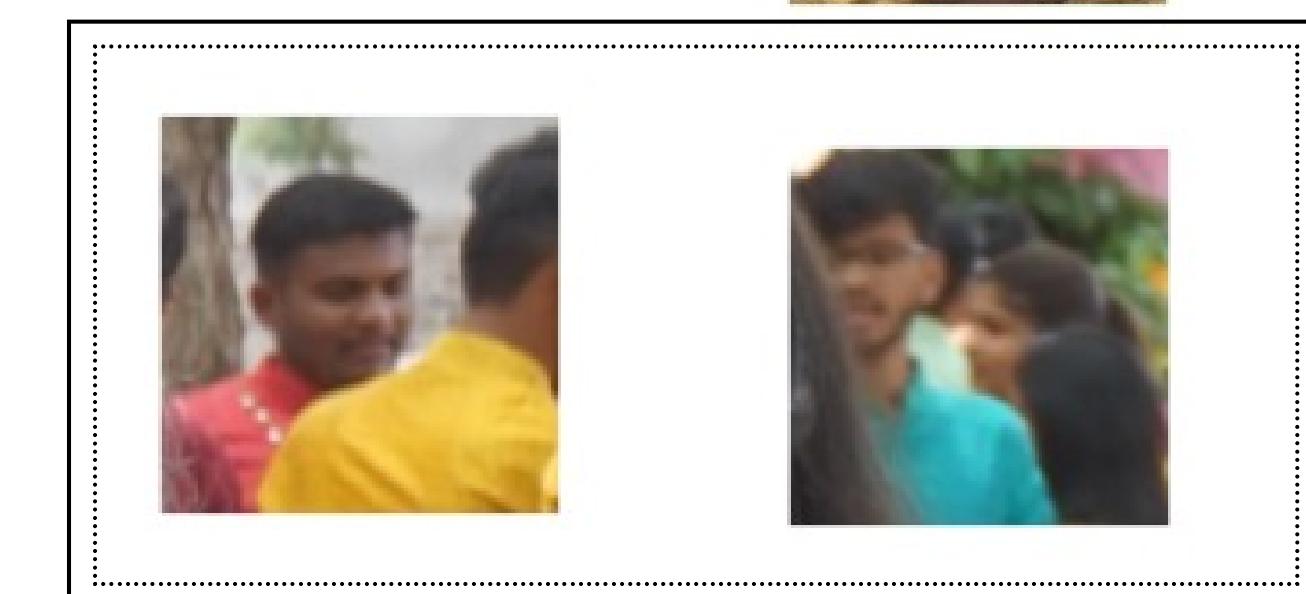


Testing on Different Data:

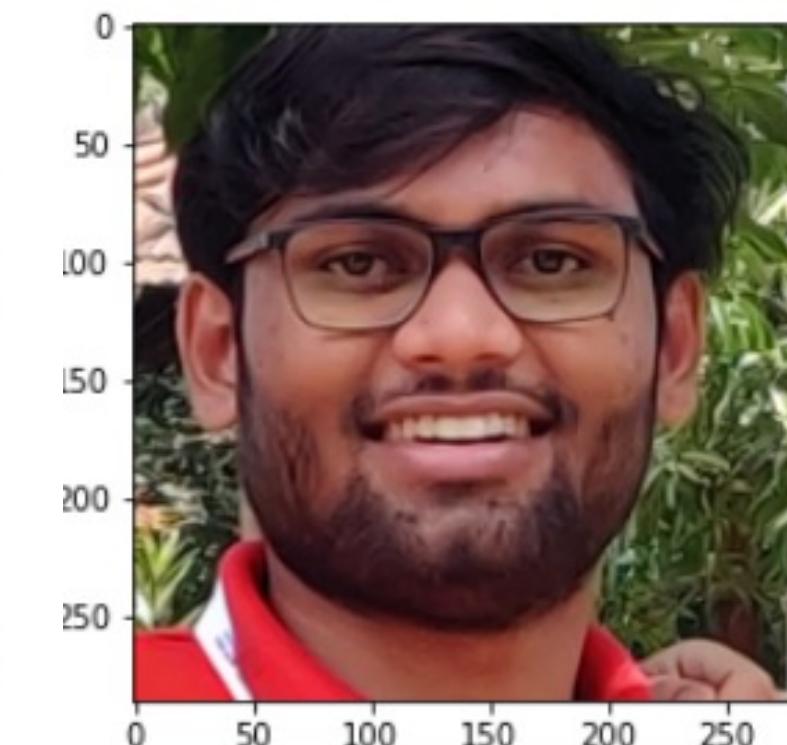
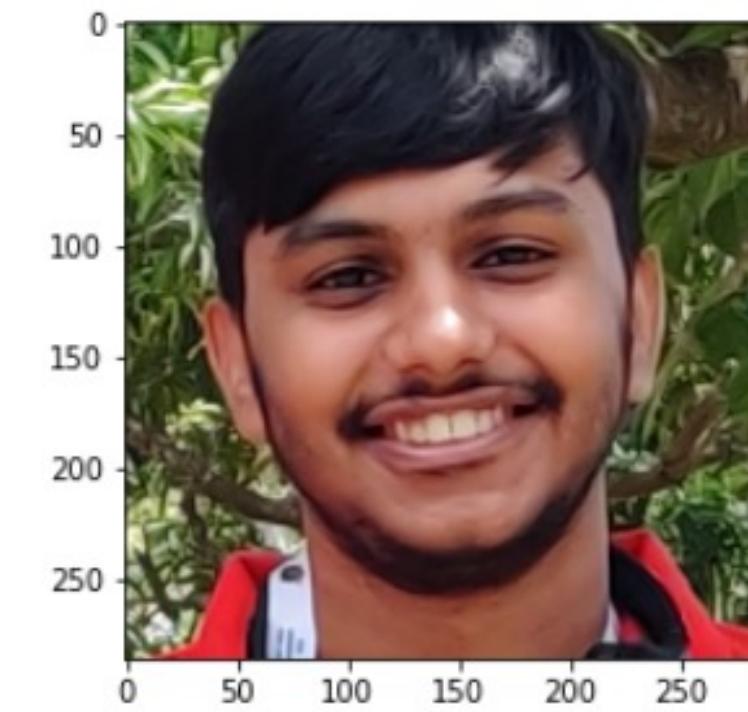
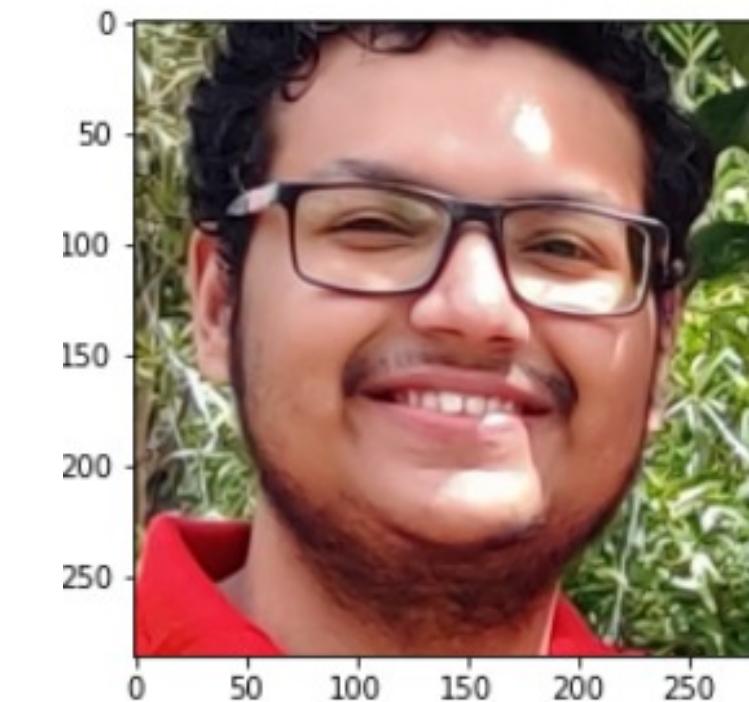
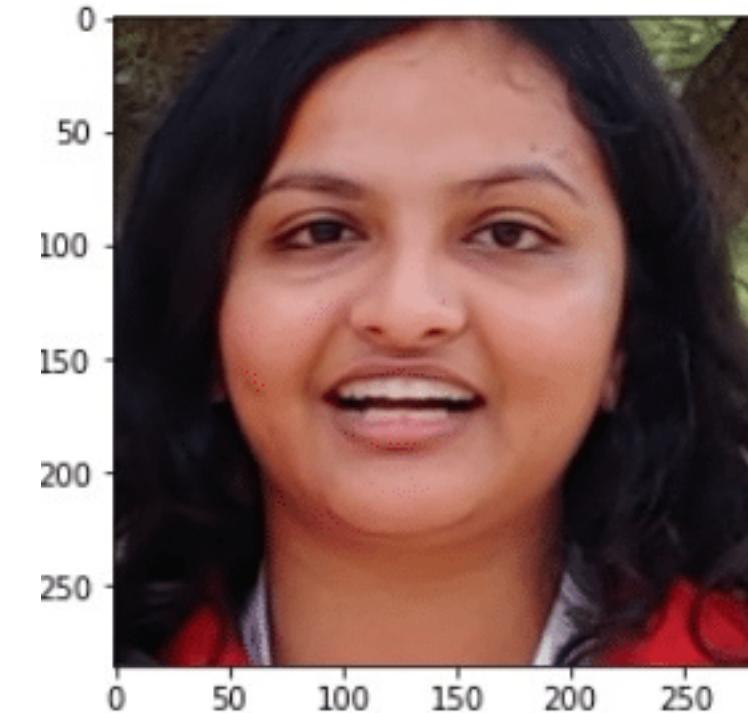
1. On actual workers



2. On different set of people



3. On same set of people in different locations:

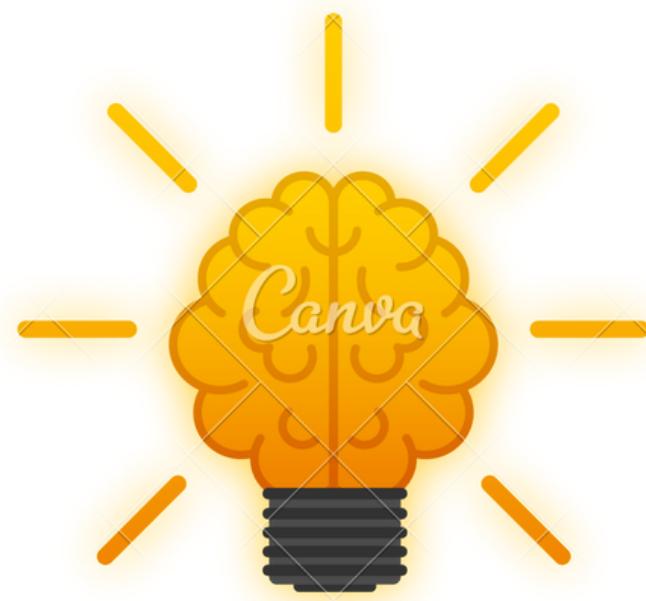


Why MongoDB?



- Comparatively easier to store longer length arrays in MongoDB. (Face Embeddings)
- Can be scaled incase of larger datasets.
- MongoDB is faster and more flexible.
- MongoDB allows nesting.

Prominent Features of our System:



- Real time Face detection and Recognition.
- Web as well as Android Application.
- Simultaneous update and storage of attendance in record.
- Live Location and Timestamp.
- Attendance Report Generation.
- Negligible Application Size (7.56 MB)