This is a test slide

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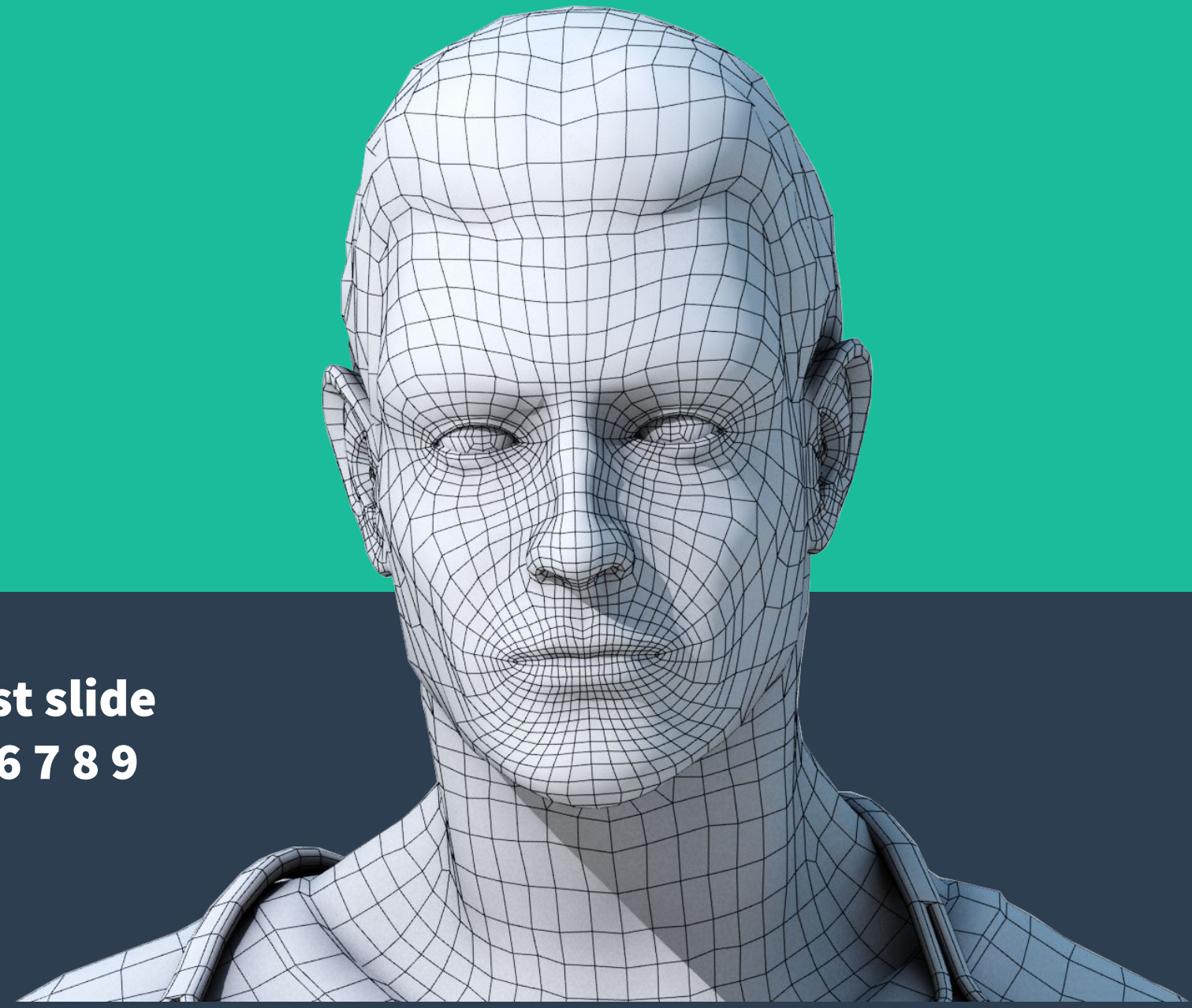

E-Attendance : Smart face Recognition

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AIM:

- To create an secure automatic attendance system using face recogniton
- Implementation of FACENET
- Hands on experience on image preprocessing and classifier training
- Understanding the principles of transfer learning

FACENET MODEL

- FaceNet is a one-shot model.
- It directly learns a mapping from face images to a compact Euclidean space.
- (where distances directly learns a mapping from face images to a compact Euclidean space where distances directly correspond to a measure of face similarity.
- Once this space has been produced, tasks such as face recognition, verification and clustering can be easily implemented using standard techniques with FaceNet embeddings as feature vectors.
- To train they use triplets of roughly aligned matching /non-matching face patches

Triplets

- A triplet is nothing but a collection of one anchor image, one matching image to the anchor image and one non matching image to the anchor image. So the triplet loss minimises the distance between the anchor and a positive, both of

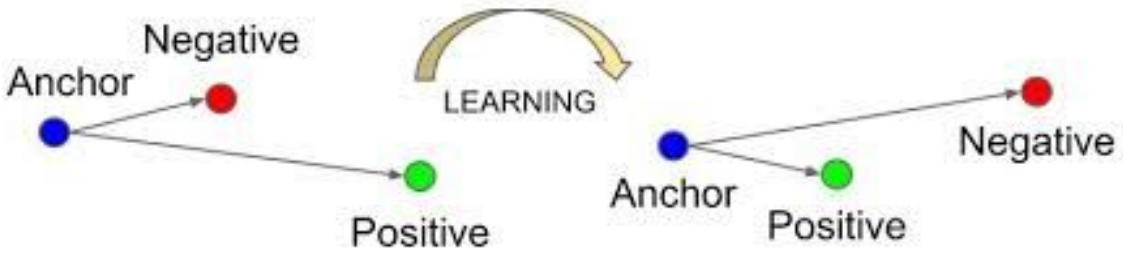

Figure 3. The Triplet Loss minimizes the distance between an anchor and a positive, both of which have the same identity, and maximizes the distance between the anchor and a negative of a different identity.

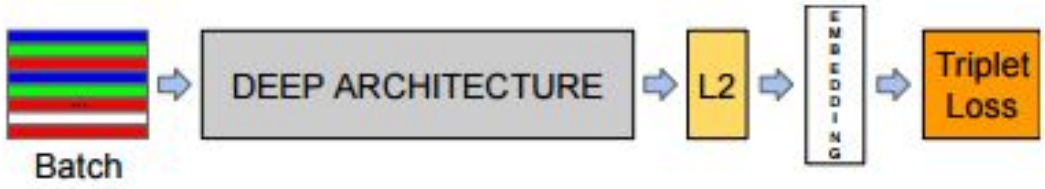

Figure 2. **Model structure.** Our network consists of a batch input layer and a deep CNN followed by L_2 normalization, which results in the face embedding. This is followed by the triplet loss during training.

Source:https://arxiv.org/pdf/1503.03832.pdf

Transfer Learning

- Is a research problem in machine learning that focuses on storing knowledge gained while solving one problem and applying it to a different but related problem.
- A machine learning method where model developed for a task is reused as the starting point for a model on a second task.
- At first a base network is trained on a base dataset and task, and then we repurpose the learned features, or transfer them, to a second target network to be trained on a target dataset and task. This process will tend to work if the features are general, meaning suitable to both base and target tasks, instead of specific to the base task.

Plan of action:

1) Collect datasets(images of candidates)
2) Preprocess the datasets,align and detect faces and store in id directory
3) Import facenet model
4) Create classifier (mostly by training the final layers of convolutinonal neural network)
5) Load the classifier to detector program
6) Load the video stream using opencv and process it by frames
7) Compare the embedding and the output the name of the least distant id to the cooresponding faces

Additional features

- Add the faces identified to and excel sheet with time stamp
- Add security by verifying liveness by blinking:implemention of face dlib and face landmarks
- Easy registering program
-

Sample data sets

- Before processing
-

- After preprocessing
-

Sample output (facerecognition)

References

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Queries