

# Face Recognition

Thursday, November 14, 2019 4:58 PM

## Canonical Pre-processing:

### Input & Processing:

1. Take Image and find the 6D point cloud (XYZ-RGB)
2. Convert in to Symmetric Matrix
3. Detect Nose Tip from Image Data
  - a. From the image first and most reliable part of the face is Nose tip.
  - b. Nose tip is required only for cropping and rough alignment
4. Cropping of the 3D Face
5. Pose Correction
  - a. given the Nose tip data face cropping can be easily done by using sphere of 8 cm radius to crop the face.
  - b. Translate the point cloud in such a way that nose tip at the origin.
  - c. Then points that are more than 8cm away the origin are removed.
  - d. Use Iterative closest point (ICP) algorithm is an accurate technique for alignment.
  - e. We register the query (XYZ only) to a reference model because of computationally expensive process (ICP)
6. Symmetric Filling
  - a. Left and right face is not perfectly symmetric so we have to use filling using alpha value =2mm
7. Smoothing and re-sampling
  - a. Fill the hole
  - b. Keep reference face as 64 points between the eyes
  - c. Smooth out the noise surface generated by capturing device
  - d. It reduces the effect of face mis-alignment
  - e. Size we will generate after re-sample is 128 X 128

### Output:

1. Create Depth Map
2. RGB Texture

### Classification of Face:

1. After getting Depth Map we can apply simple classification algorithm to find either given input is align to data face data or not
2. Find the distance to check the either face or not
3. Find the miss-classification error using RMSE