Content Based Retrieval on 3D Face Data

Ezgi Mercan
Motivation

• Indriyati Atmosukarto’s Thesis:
  – Global 2D azimuth-elevation angles histograms are successfully used in 3D shape quantification for deformational plagiocephaly and classification of 22q11.2DS.
  – Can we use azimuth-elevation angles histograms for retrieval?
Image Acquisition: 3dMD
About the Data

• ‘us’ database: 14 head meshes of 12 people.
• Data is limited
  – Hard to find similarity
  – No ground truth: survey.
Methodology

Pose Normalized Heads

Masking

Histograms
Feature Extraction

- Compute the azimuth and elevation angles of the surface normal vectors of each point on the mesh.
- Construct 2D histograms of angles.
Query for Carrie - eyes

Retrieval Results:

Ground Truth:
Query for Jia - mouth

Indri  Jia 2  Lynn 2  Lynn  Carrie  Eric  Eric's son
Sarah  Steve  Xiang  Kasia  Dingding  Linda
Discussion

• Ground truth: people’s perception of similarity.

• Azimuth & Elevation angles may not correspond to human’s perception of similarity.

• Database is too small to derive a statistically significant result.
Future Work

• Alternative features: Gaussian Curvature, Lynn’s method of distance matrices.
• Larger databases: FaceBase collaborator Seth Weinberg’s data repository of 3500 healthy Caucasian individuals.
• User friendly GUI.