

Measuring Symmetry in Children With Cleft Lip. Part 3

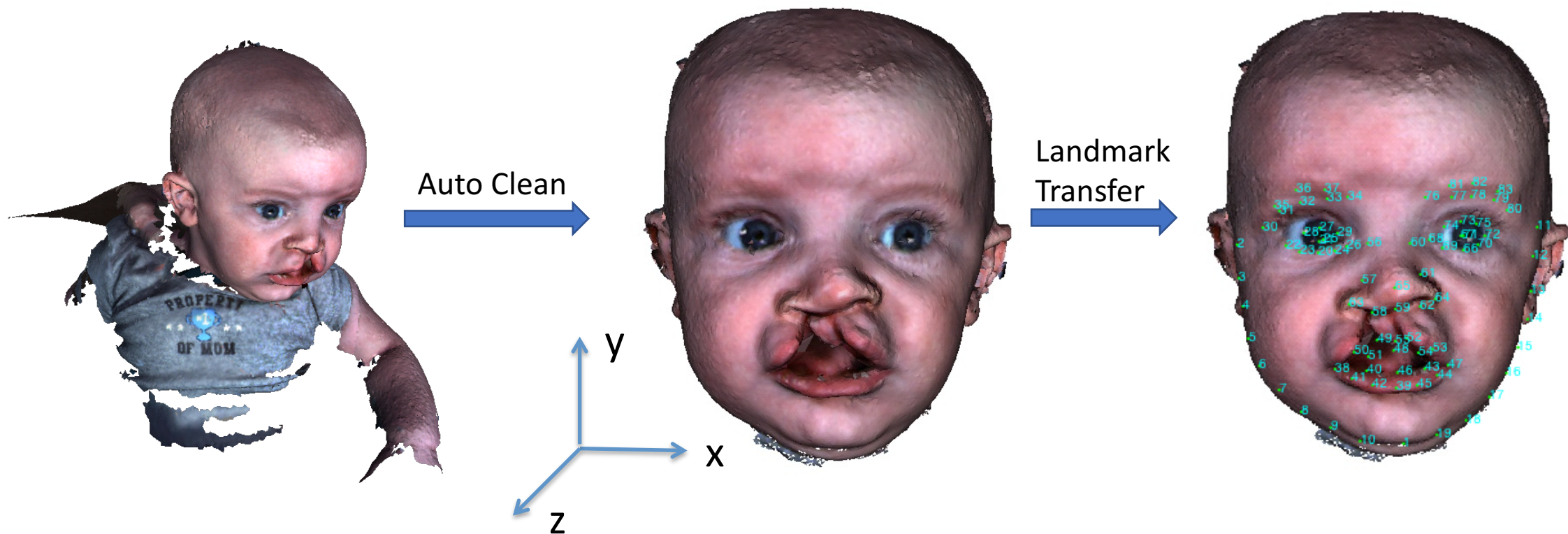
Shu Liang

11/20/2017

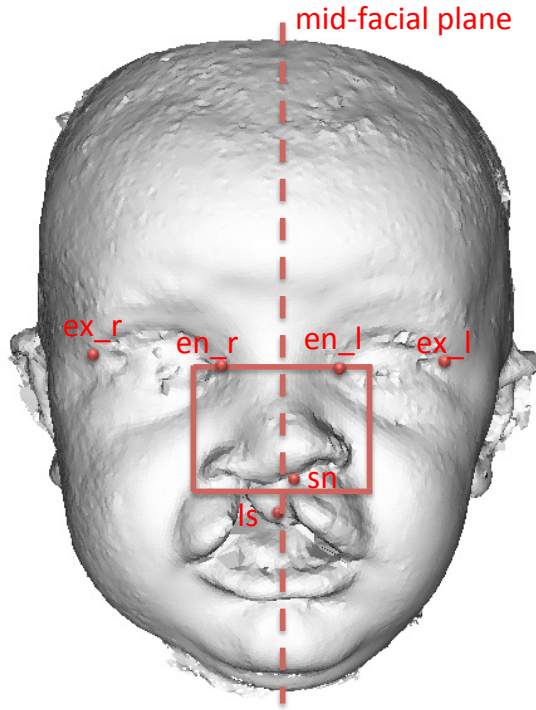
Measuring Symmetry in Children With Cleft Lip. Part 3

- Pre-processing
- Nasal Symmetry: Depth Area Difference
- Nasal Normalcy: Principle Component Analysis Reconstruction Error
- Result and comparison

Pre-processing



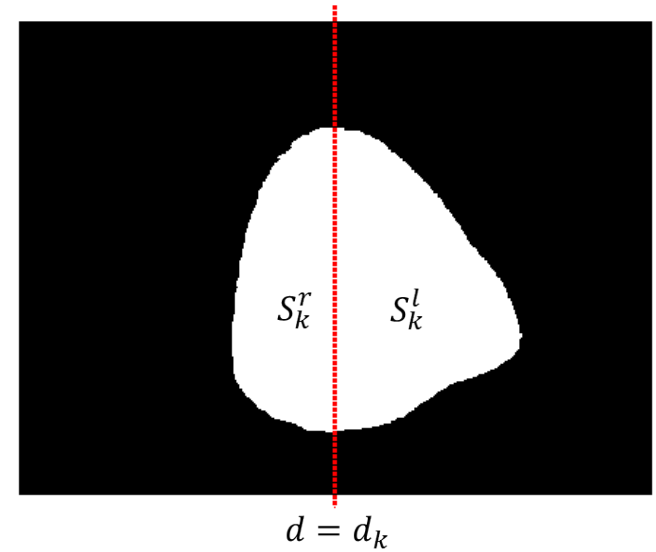
Nasal Symmetry: Depth Area Difference



Calculate mid-plane

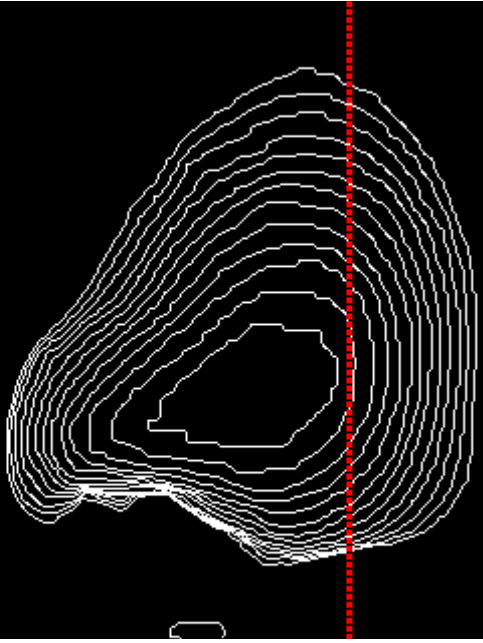


Rendered 2.5D depth map

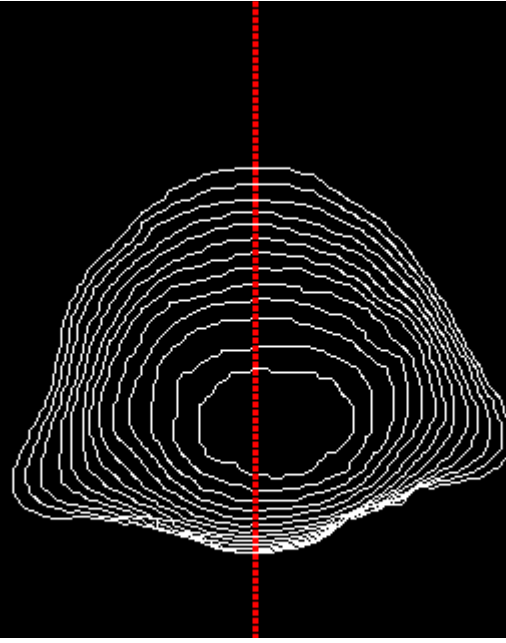


Example of a cutting plane d_k

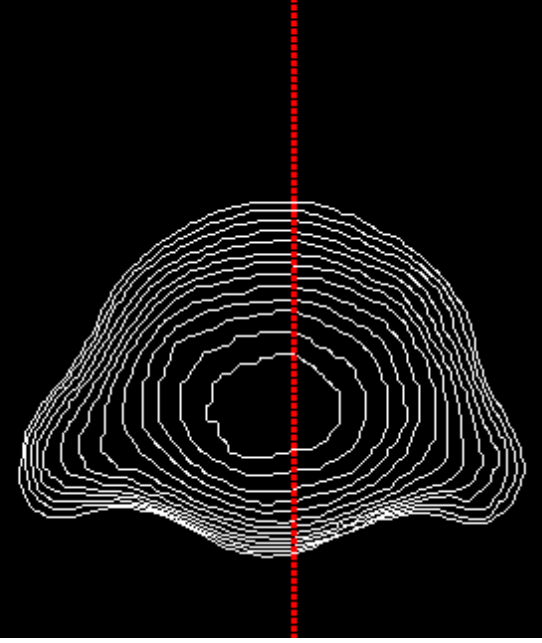
Nasal Symmetry: Depth Area Difference



Subject with unpaired cleft lip



The same subject immediately
after cleft lip repair



Age-matched control subject
with "normal" nose

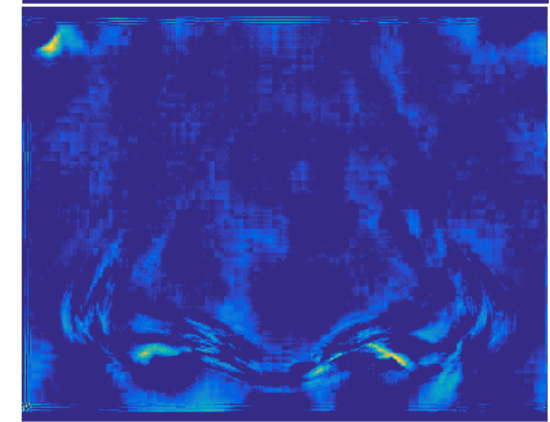
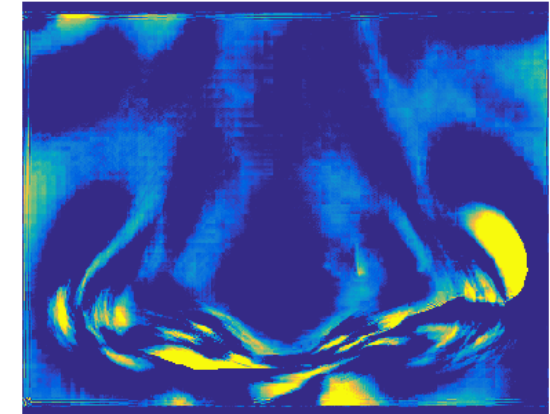
Nasal Normalcy: Principle Component Analysis Reconstruction Error

- We render 2279 normal Caucasian 3D faces into depth map and extract the first 100 PCs.

$$S_{error} = \min_{\bar{\beta}} \left\| \left(\bar{T} + \sum_{i=1}^{100} \beta_i t_i \right) - T_{input} \right\|_2^2$$

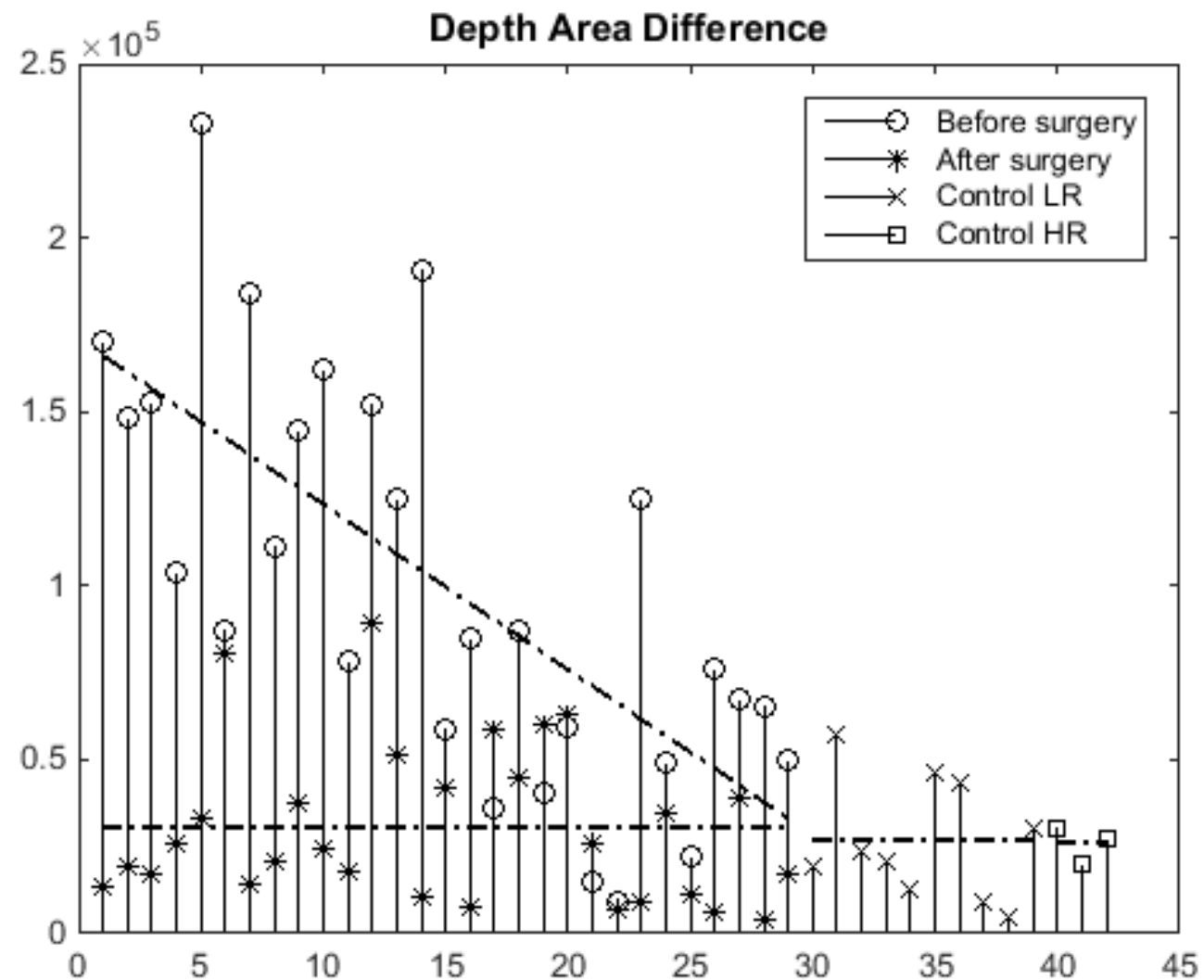


Aligned head mesh



Error map from PCA reconstruction

Result and Comparison



Result and Comparison

