Tool Tracking for Periacetabular Osteotomy using CamC



Background

 Periacetabular Osteotomy (PAO) is an orthopedic surgery that reorients the patient's acetabulum to provide better coverage for the femoral head.

Motivation

- Previous tracking methods involve multiple x-ray images which are harmful and time consuming.
- Track the tool intra-operatively in order to improve the accuracy of bone alignment.



Methods

 Use RGBD camera augmented mobile C-arm(CAMC) to reduce the amount of X-ray images needed.



Segmentation

- Background subtraction
- RANSAC remove outliers
- Color segmentation



Pose estimation

- Sample consensus based initial alignment
- ICP with kd-tree for fine alignment

Results

- Max error length-wise is 11 mm
- Max error width-wise is 2mm





Member(s):Billy Carrington and Wenhao Gu
Mentor(s): , Mathias unberath, Sing Chun Lee, Mohammadjavad fotouhighazvini, Prof. Tis, Prof. Armand.

Group ID: 11