

Image Guidance System for Breast Cancer Surgery

Summary

Vanderbilt researchers have developed an image guidance system that aims to reduce the revision rate for breast conserving surgeries through the use of intraoperative tumor location. The platform integrates MRI imaging, optical tracking, tracked ultrasound, and patient specific biomechanical models to provide a superior tumor localization end result.

Addressed Need

Current reoperation rates for breast cancer surgeries average 20-40% due to the difficulty of determining tumor borders during surgery. This invention addresses that exact need by making it easier to locate the boundaries of the tumor intraoperatively.

Unique Features

- ◇ Use of image guidance system to aid in localization during breast cancer surgery
- ◇ Includes an algorithm for registration of patient-specific biomechanical models
- ◇ Intraoperative tracked ultrasound is used to model subsurface anatomical features
- ◇ Image guided approach is compatible with standard supine surgical presentations

Technology Development Status

This technology has been through preliminary testing and validation. Preoperative and intraoperative data has been collected and both rigid and non-rigid registrations have been performed to align preoperative data to intraoperative space with clinically relevant accuracy. The system has been tested on two patient subjects, and further studies will be performed on additional breast cancer patients to optimize data acquisition procedures.

Intellectual Property Status

Issued US patent: [10,426,556](https://patents.google.com/patent/10426556)

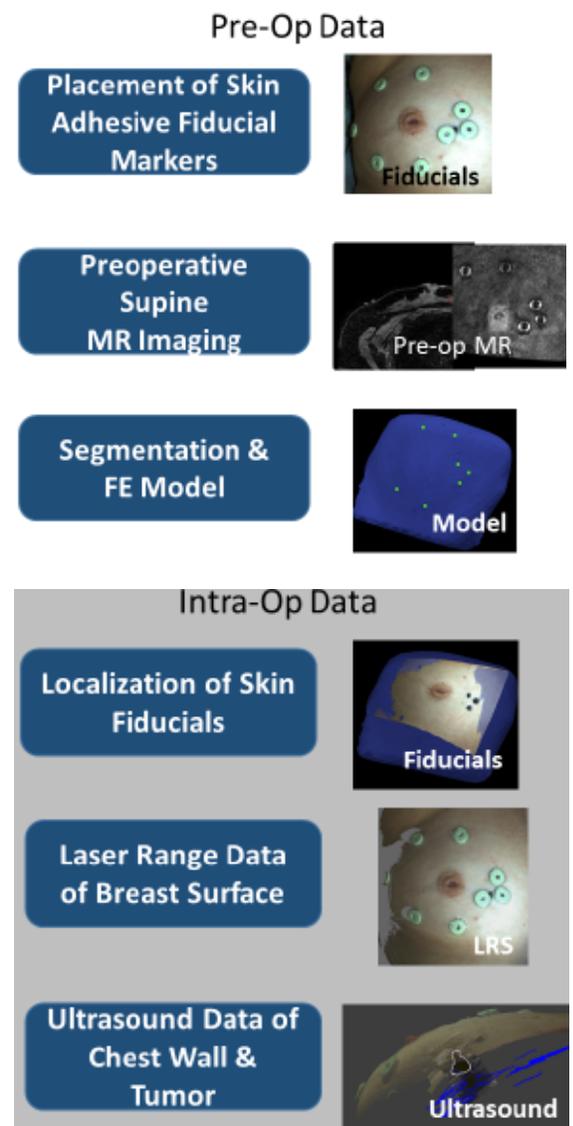


Figure 1: Preoperative and intraoperative data collected by the system is shown.

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