

Precise positioning system for μ -tomography

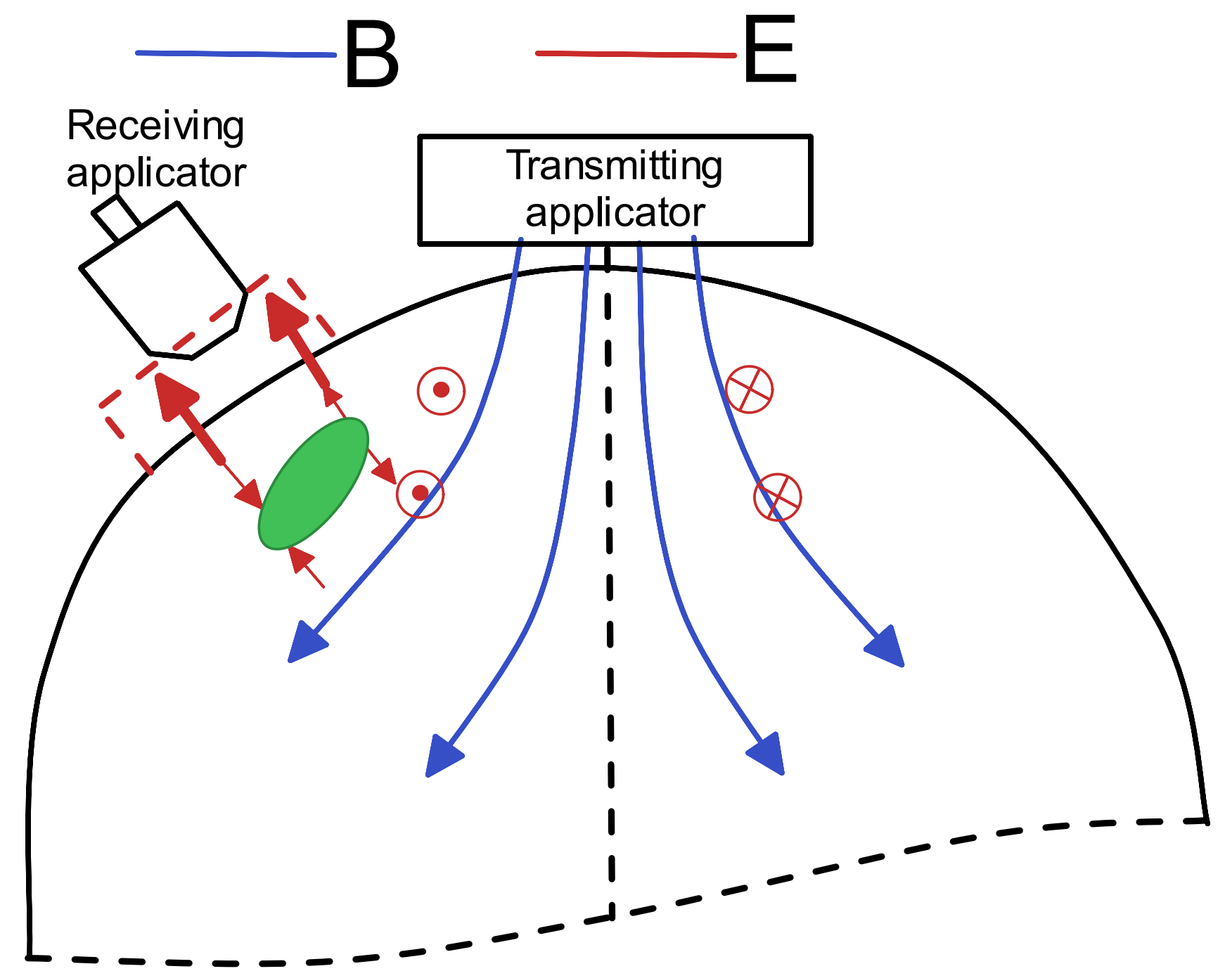
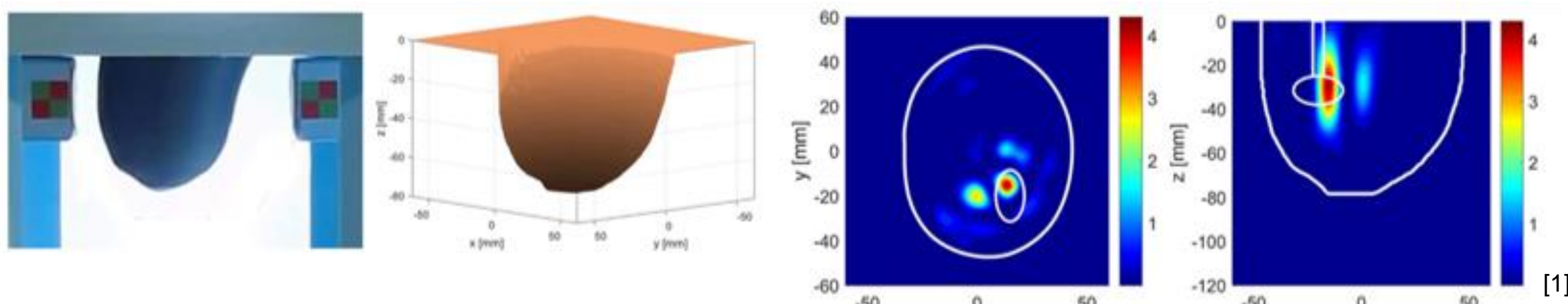
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WHAT IS μ -TOMOGRAPHY?

Microwave tomography (MWT) is a biomedical imaging technique where microwaves are used to produce cross-sectional images.

MWT poses as a potential complement to mammography, being suitable for both detection and recurrent monitoring during treatment. In previous projects various aspects of μ -imaging have been tested and improved.

In this project, the focus is to achieve precise positioning of the microwave transmitters on an object for improved scanning.



CREATING A VIRTUAL TWIN OF A REAL-WORLD OBJECT

ABB YuMi Collaborative Robot

ABB has lent us a one-armed YuMi, a collaborative robot with high precision and several safety features, making it potentially suiting for medical applications.

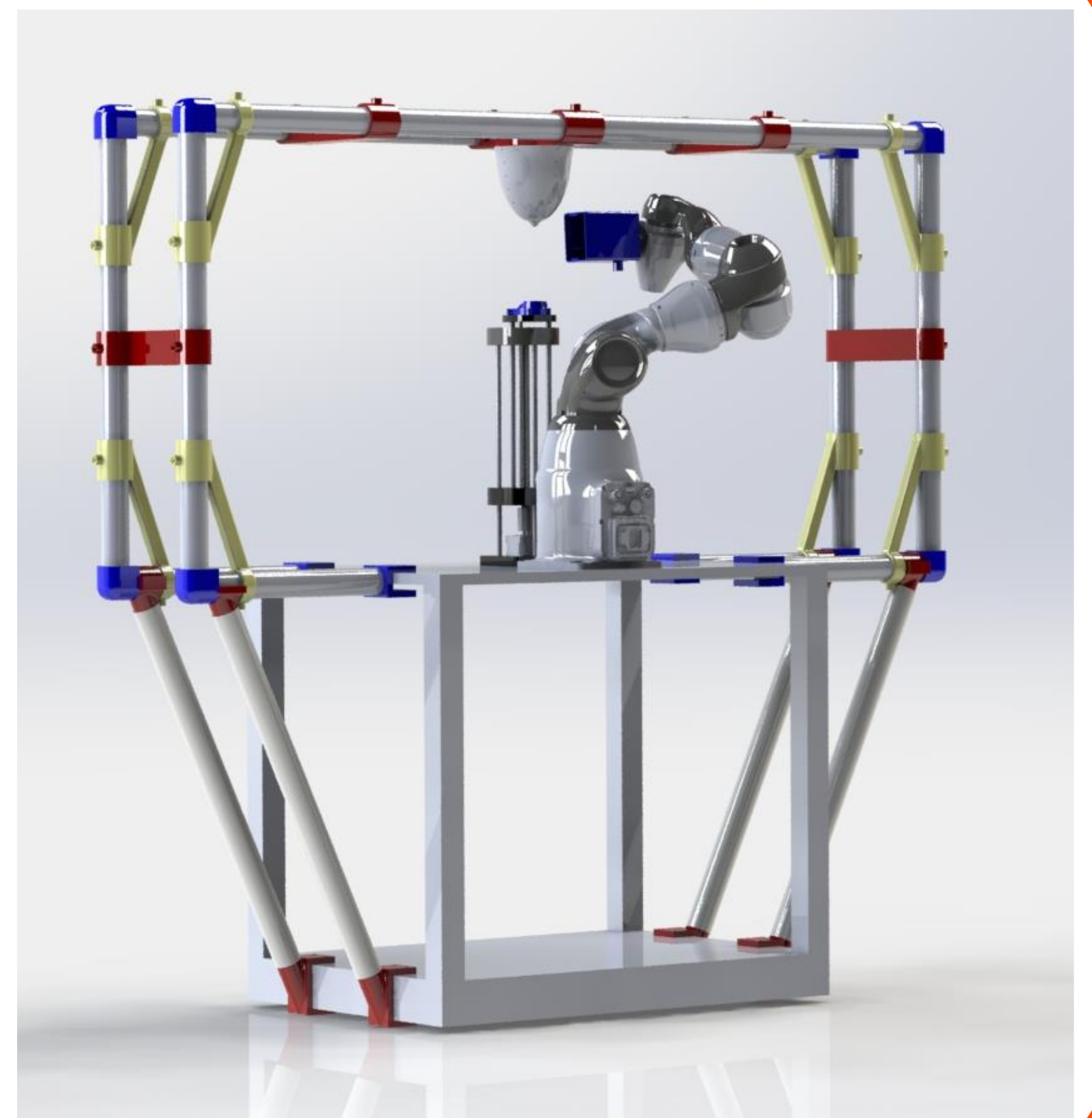
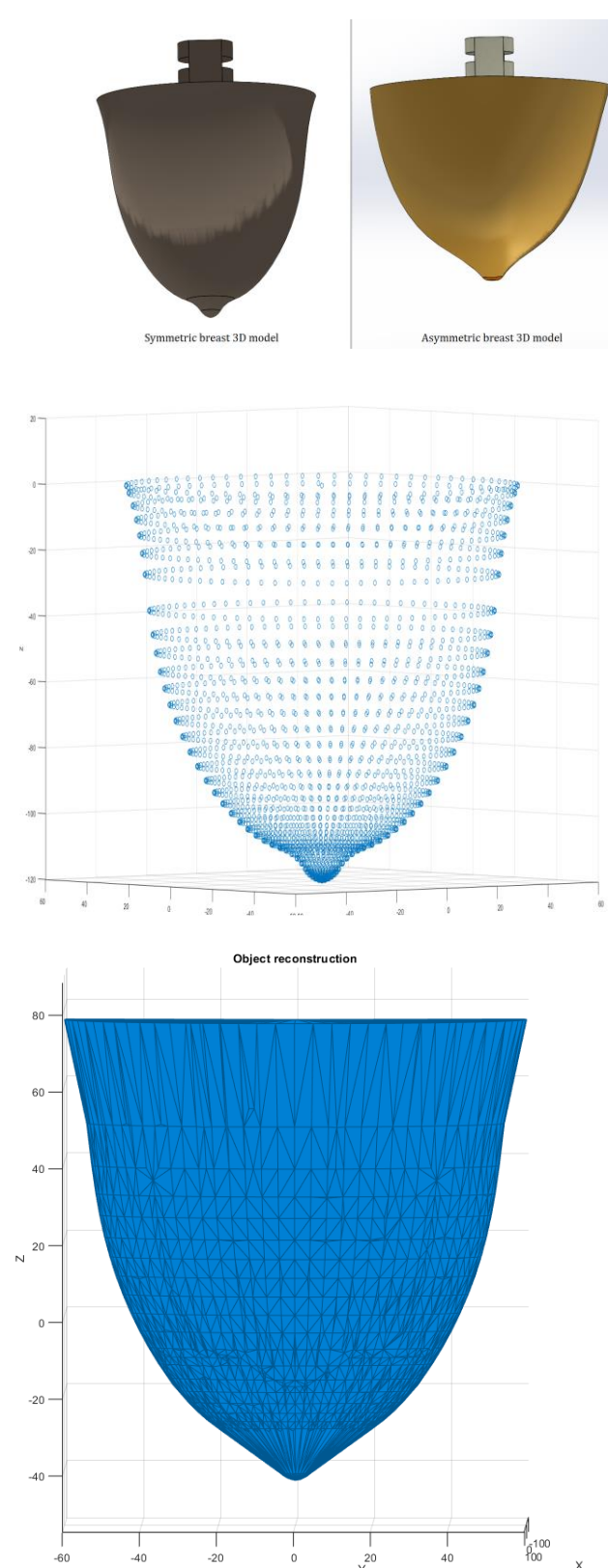
The YuMi is used to position the receiving applicator and laser sensor.

Scanning of object

The object is scanned with a laser sensor, locating the object in the working space and producing point clouds used for the surface reconstruction.

Approximation of surface

The coordinate points collected with the laser are interpolated and the surface of the object is approximated through algorithms like powercrust and alpha shape.



POSITIONING & CONTROL OF TRANSMITTERS

GUI

After the object is scanned and modelled, the user can interact with the model through the GUI, where its possible to inspect, manually control the transmitters position and configure various scanning sequences.

Generation of μ -scanning points

Information is gathered from the model to place μ -scanning points along the objects surface. Different modes are available. Either the user clicks on the object to select points, or an algorithm generates them at even spacing at different densities.

