Contribution ID: **22** Type: **Poster**

The USCT reference data base

Thursday, November 2, 2017 3:00 PM (1 hour)

Ultrasound Computer Tomography (USCT) is an emerging technology mostly aimed at breast cancer imaging. Following the idea of open science a USCT reference data base (http://ipeusctdb1.ipe.kit.edu/~usct/challenge/) is established with open and easy to use data and code interfaces. The aim is to promote and facilitate the exchange of available reconstruction algorithms and raw data sets from different USCT devices throughout the growing USCT community.

(2) Material and Methods

Currently three systems with rather different transducer aperture and ultrasound frequency range provided raw data sets for the USCT data base: KIT's 3D Ultrasound Computer Tomography system (3D USCT), Delft Breast Ultrasound Scanner (DBUS) and Multimodal Ultrasound Breast Imaging System (MUBI). All data sets are provided with data access interface software. The source code is freely available and an issue tracker is provided at a \href{https://github.com/KIT-3DUSCT/3DUSCT-data-access-script}{Github repository}.
The materials of the USCT data base are provided using a free and open license, i.e. the BSD 3-clause license for code and data, allowing for free use and publication of results.

(3) Results

As a result of the joint initiative, a data base has been set up. In addition, a kick-off event for the USCT data base took place at the USCT data challenge at SPIE Medical Imaging 2017. The aim of this event was to bring together experts from the USCT community to identify best practices, as well as to establish specifications for interfaces and to carry out a first comparison of reconstructed images. Six posters were presented and three detailed field reports of groups applying their reconstruction methods to the provided data were submitted. The challenge hosted a two-hour panel discussion, where the panelists and the audience discussed the experiences on applying the currently available datasets and future directions.

(4) Discussion and Conclusion

We expect the data base to enable reproducible comparison of image reconstruction algorithms and USCT systems. It should establish user friendly and easy to use interfaces, standards and data formats between the different USCT systems and their reconstruction algorithms, software and data formats. Further challenges are planned, e.g. comparing the image quality and/or computational performance obtained by different algorithms. Finally, other groups are invited to join in and participate.

Author: Dr RUITER, Nicole (Karlsruhe Institute of Technology)

Co-authors: Dr FRITSCH, Carlos (Spanish National Research Council); Prof. GEMMEKE, Hartmut (Karlsruhe Institute of Technology); Dr HERRAIZ, Joaquín L. (Complutense University Madrid); Dr CAMACHO, Jorge (Spanish National Research Council); Mr CRUZA, Jorge F. (Spanish National Research Council); Dr UDIAS, Jose Manuel (Complutense University Madrid); Dr VAN DONGEN, Koen W. A. (Delft University of Technology); Dr PEREZ

LIVA, Mailyn (Complutense University Madrid); Mr ZAPF, Michael (Karlsruhe Institute of Technology); Dr HOPP, Torsten (Karlsruhe Institute of Technology)

Session Classification: Poster session

Track Classification: Main Track