Materials List for:

An Experimental Protocol for Assessing the Performance of New Ultrasound Probes Based on CMUT Technology in Application to Brain Imaging

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Materials

Name	Company	Catalog Number	Comments
ULA-OP	University of Florence	N/A	Ultrasound imaging research system
3D imaging piezoelectric probe	Esaote s.p.a.	9600195000	Mechanically-swept 3D ultrasound probe, model BL-433
Linear-array piezoelectric probe	Esaote s.p.a.	122001100	Ultrasound linear array probe, model LA-533
CMUT probe	University Roma Tre	N/A	Ultrasound linear array probe based on CMUT technology
MAGNETOM Skyra 3T MR scanner	Siemens Healthcare	N/A	MR scanner
Head coil	Siemens Healthcare	N/A	32-channel head coil for MR imaging
NDI Polaris Vicra	NDI Medical	8700335001	Optical motion tracking system
Pointer tool	NDI Medical	8700340	Passive pointer tool with 4 reflecting markers
Clamp-equipped tool	NDI Medical	8700399	Rigid body with 4 reflecting markers and a clamp to be connected to the US probe handle
Bovine brain	N/A	N/A	Brain of an adult bovine, from food suppliers
Formalin solution	N/A	N/A	10% buffered formalin solution for bovine brain fixation - CAUTION, formalin is a toxic chemical substance and must be handled with care; specific regulations may also apply (see for instance US OSHA Standard 1910.1048 App A)
Plastic container for anatomical parts	N/A	N/A	Cilindrical plastic container with lid
Glass spheres	N/A	N/A	3 mm diameter spheres of Flint glass
Agar	N/A	N/A	30 g, for phantom preparation
Glycerine	AEFFE Farmaceutici	A908005248	100 g, for phantom preparation
Distilled water	Solbat Gaysol	8027391000015	870 g, for phantom preparation
Beaker	N/A	N/A	Beaker used for the dilution of glycerine and agar in distilled water

Lysoform	Lever	8000680500014	A benzalkonium chloride and water solution was used for the agar phantom preservation
Polystyrene mannequin head	N/A	N/A	Polyestirene model which was cutted and used to design the configuration of spheres'patterns
Green tissue marking dye for histology	N/A	N/A	Colour used to mark the glass spheres' positions on the bovine brain surface
Yellow enamel	N/A	N/A	Enamel used to colour the glass spheres implanted in the agar phantom
Water tank	N/A	N/A	50x50x30 cm plastic tank filled with degassed water up to a 15 cm height
Mechanical arm	Esaote s.p.a.	N/A	Mechanical arm clamped to the water tank border and used to held the probe in fixed positions
Plate of synthetic resin	N/A	N/A	Plate used as a support for the bovine brain positioning in the water tank
Sewing threads	N/A	N/A	Sewing thread segments used to immobilize the brain on the resin plate
Adhesive tape	N/A	N/A	Adhesive tape used to fix the sewing thread extremities onto the resin plate
Plastic food container	N/A	N/A	Sealed food container used for the agar phantom
Notebook	Lenovo	Z50-70	Lenovo Z50-70, Intel(R) Core i7-4510U @ 2.0 GHz, 8 GB RAM
Workstation	Dell Inc.	T5810	Intel(R) Xeon(R) CPU E3-1240v3 @ 3.40 GHz, 16 GB RAM
Matlab	The MathWorks	R2013a	Software tool, used for space transformation computation and 3D reconstruction from image planes
Paraview	Kitware Inc.	v. 4.4.1	Open-source software for 3D image processing and visualization
NDI Toolbox - ToolTracker Utility	NDI Medical	v. 4.007.007	Software for marker position visualization and tracking in the NDI Polaris Vicra measurement volume
C++ data-logging software	NDI Medical	v. 4.007.007	Software for marker position recording on a text log file
ULA-OP software	University of Florence	N/A	Software for real-time display and control of the ULA-OP system