Section: **Validierung**

ID: 96

Abstract-Title:
ENTWICKLUNG EINER SCHNITTSTELLE ZUR NEURONAVIGATION ZUR ÜBERTRAGUNG VON INSTRUMENTENKOORDINATENDEVELOPMENT OF AN INTERFACE TO A NEURO-NAVIGATION SYSTEM FOR RETRIEVING COORDINATES OF TRACKED INSTRUMENTS

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Abstract-Text:
Purpose:
Intraoperative subcortical stimulation has the potential to validate preoperative diffusion tensor imaging data in tumour patients since the functional aspect of the stimulation ought to be correlated with the ascertainable integrity of the fibres stimulated. To correlate the locations of the stimulation tracked intraoperatively by an neuro-navigation system with the diffusion tensor imaging results an interface to the navigation system is needed to read out the tracking data and to transfer it to an external processing and storing computer.

Method:
The BrainLab software “Vector Vision Link” (VVLink) allows external computers to communicate with the BrainLab navigation system and to connect it to a local network. Via VVLink data sets of the coordinates and the orientation of instruments tracked by the navigation system can be accessed. It is also possible to retrieve the image data that is used for navigation and display it on the external computer. BrainLab provides the application programming interface “VVLink Client API” for building own VVLink clients.

The image processing software AMIRA (Mercury/TGS) installed on an external computer offers various functions of image processing and visualisation not available on the navigation system. These functions are implemented in modules that can be further developed by the application programming interface of AMIRA (AMIRA Developer Package) by using Open Inventor libraries for visualisation.
A developed and separately implemented AMIRA module called “VVLinkInterface” allows to access the navigation system by a graphical user interface in the parameter window of AMIRA. After specification of the network IP address and the password the designated data, e.g. patient information or acquired labeled points, is transferred from the navigation system to AMIRA by an active user interaction. Finally the position and the orientation of a tracked instrument, e.g. a pointer, can be queried online and visualised in AMIRA as a moving pointer.

Results:
The in-house developed interface enables to retrieve data from the navigation system and

to display it in an external image processing software AMIRA. This allows to correlate intraoperative functional tests with preoperative imaging. For this process it is important to take account of the brain shift induced by craniectomy. The interface was tested with a data set of a phantom.

Conclusion:
For retrieving tracking data from the navigation system an interface was implemented which connects the navigation system with an external computer for image processing and visualisation. For further improvement of the interface the possibility of controlling the camera of the viewer in AMIRA via a tracked instrument will be implemented. This will give the opportunity to explore datasets that cannot be visualised in the viewer of the navigation system.

Bild 1/JPG