Training and learning software in the field of focused ultrasound therapy of the liver

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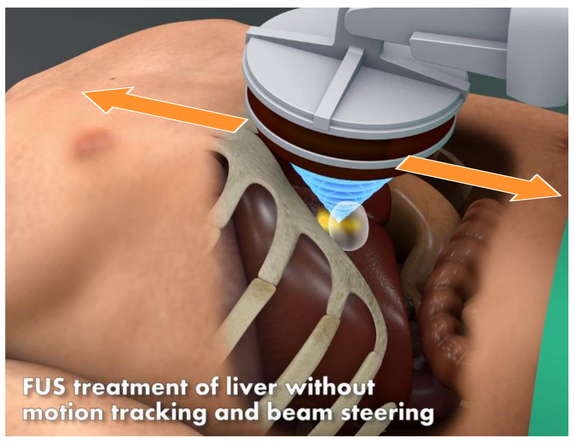
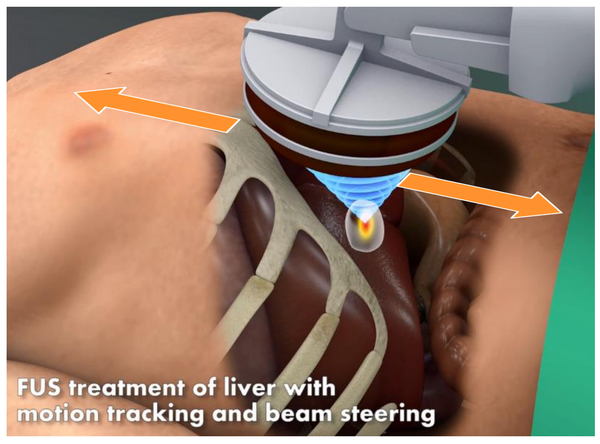
Vision

FUS in moving organs can be realized by updating the focal spot to follow the target motion (steered FUS). A training and learning software can help unexperienced physicians and can assess the efficiency and effectiveness of the treatment.



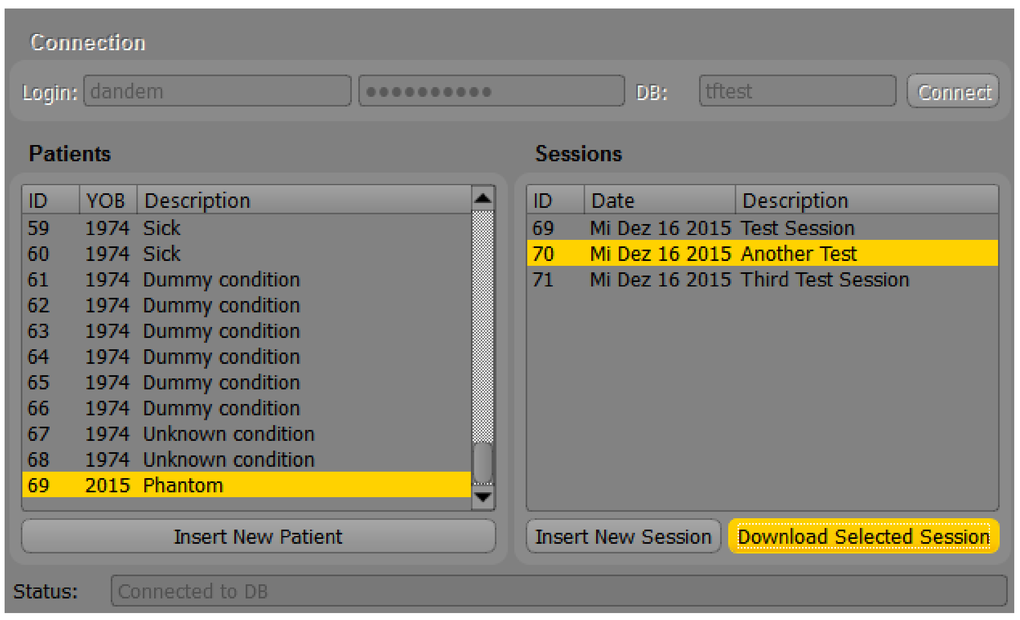
Without steering the energy is distributed to a larger volume.



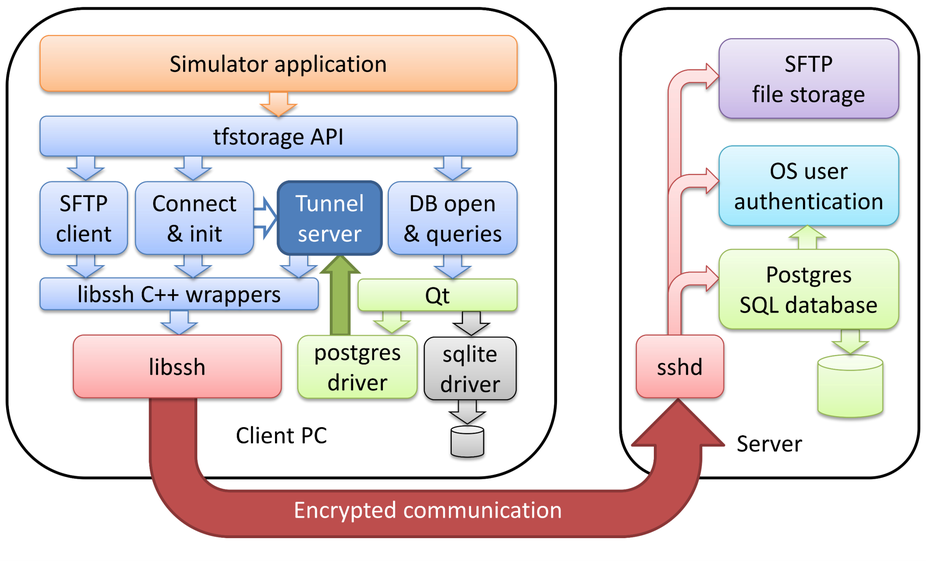
Steering leads to a sharp heating pattern.

Database for relevant clinical cases

Relevant clinical cases can be stored and accessed later for training and learning from multiple sites. All communication and data are encrypted. The database exploration utility allows to upload or download data.

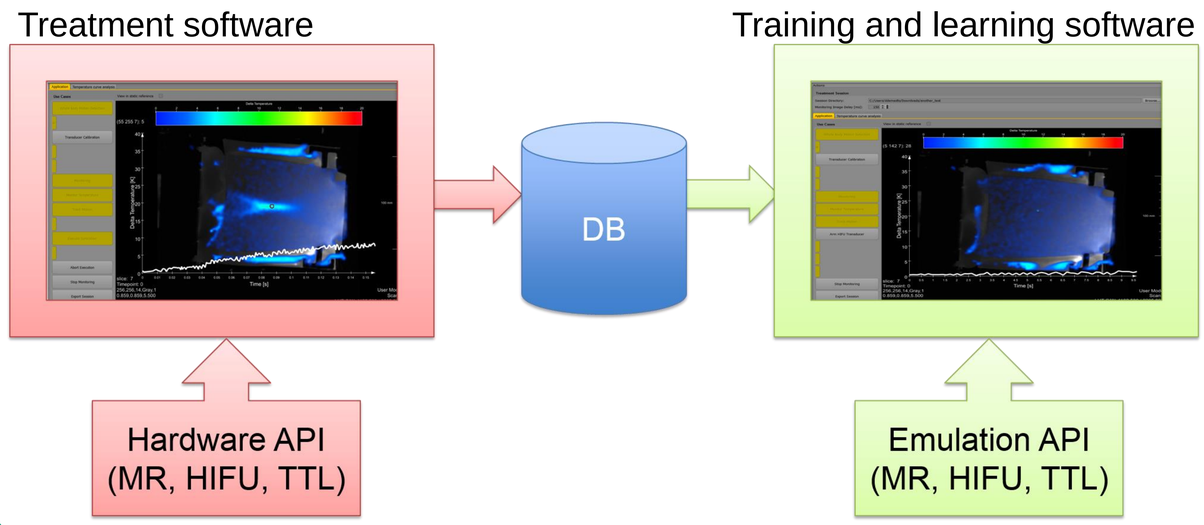


Database communication channel



Communication via database

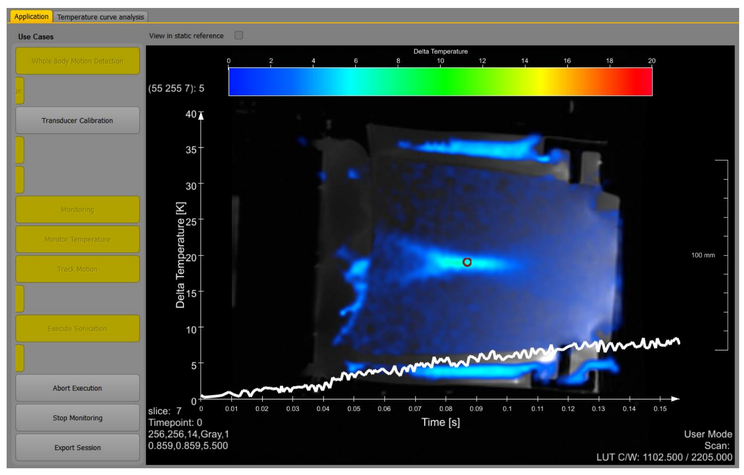
While the treatment system uses the real hardware APIs from the MR device and the HIFU device, the training and learning system uses emulated APIs for those hardware components and is thus independent of any hardware. Both systems can be connected via the database. They are using the same application core.



Training and learning software

The training and learning software can be used for

- training on how to use the treatment software
- training of unexperienced physicians using mathematical simulation methods to predict the outcome
- learning from previously performed procedures
- analyse the effectiveness and efficiency of performed treatments
- exploring new algorithms for tracking, temperature monitoring and motion compensation on existing data



Results

The training and learning software offers a **variety of indications for use**. The main advantage is that **no hardware** is needed to use the training and learning system. All **hardware components are emulated** with appropriate software modules.
The **software** to be used in clinical studies during the TRANS-FUSIMO project is **new and advanced** to the personel. The training and learning system enables the operator rehearse before treating patients in the same interface and functionality as in real-world scenarios.
The **database** itself can also be used to upload **cases from different sites** to learn about the performance of FUS procedures as well as the effect on improved tracking, temperature and motion compensation algorithms.

Acknowledgements

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