



Fraunhofer Institut Biomedizinische Technik

Optoacoustic image acquisition system and software



Description

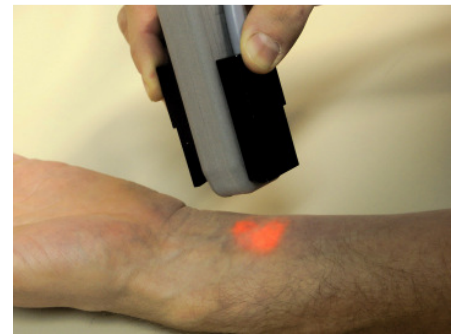
Optoacoustic imaging is a new modality which provides valuable tissue information which is complementary to conventional ultrasound images. By giving access to optical contrast with an acoustical detection mechanism, optoacoustics combine the benefits of optics and acoustical imaging.

Based on the DiPhAS beamformer system, we developed a hardware platform for the detection and processing of optoacoustic signals. This system combines the features of a classical digital ultrasound beamformer with the special hardware requirements related to real-time optoacoustic imaging. The software and hardware concepts allow easy integration of different laser sources for the generation of optoacoustic signals.

The integration of different laser sources in the system permits to tune the system's sensitivity towards the detection of defined tissue types. Hence, the system is suited for imaging tissue structures with high intrinsic optical contrast such as blood vessels as well as for the detection of biologically targeted nanoparticles in the context of molecular imaging.

Our Offer

We offer you a fully developed freely programmable ultrasound research platform which features the particular hardware and software requirements related to optoacoustic imaging. An interface for the integration of different laser systems is foreseen as well as modified reconstruction algorithms for optoacoustic imaging. Different imaging modalities allow to combine the advantages of both modalities. Furthermore, we developed optimized ultrasound transducers including optical adapters for the targeted delivery of laser pulses to the region of interest.



Combined transducer with laser light delivery



Optoacoustic image of vessels in a human forearm generated with DiPhAS and a Nd:YAG laser

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