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3D interventional nuclear medicine imaging and therapy monitoring

Radio-guided surgery is defined as any surgical procedure which utilizes a radiation detection device in a real-time fashion within the operating room for the identification of a radioisotope administered to a patient prior to the time of attempted detection and with the sole purpose of assisting in the successful performance of that surgical procedure. There is a wide application domain in the surgery room for sentinel lymph node marking, marking of primary tumors and also injection of radio-isotopes for selective internal radiation therapy. A commonly used radiation detection system during radio-guided surgery is a handheld gamma probe. The use of imaging during surgery is in general not facilitated since it is only available in a few high-tech operating rooms. Free-hand SPECT was introduced as a technology for 3D radio-guided surgical procedures such as sentinel lymph node biopsy. In addition to the information provided by conventional gamma probes, free hand SPECT allows a 3D reconstruction and a visualization of the distribution of radioactivity in the region of interest. Free hand SPECT is combined with a navigation system facilitating precise guidance to radioactive marked lesions provides depth measurement, and intuitive augmented reality visualization. A summary of currently available clinical data on the use of free hand SPECT will be provided for sentinel lymph node biopsy of various malignancies, and for radio-guided localization of primary tumors. A comprehensive technology review of mobile SPECT solutions will be provided along with advanced features e.g., image fusion with diagnostic ultrasound or with a cone beam CT in an interventional radiology suite.

Biography

Joerg Traub has completed his PhD from TU Munich with highest distinction. After graduation, he was a co-founder of Surgic Eye GmbH. He is CEO and President of Surgic Eye, an innovator in the field of mobile nuclear imaging during therapy, for the past 8 years. He has published more than 50 peer-reviewed journals and full paper conference papers. He is co-inventor of more than 10 patents and has been serving as reviewer in several medical imaging and computer assisted surgery journals and conferences.

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