RadSpeech – A Semantic Speech Dialogue System for Radiologists

THESEUS
Forschungsprogramm für eine neue internetbasierte Wissensinfrastruktur

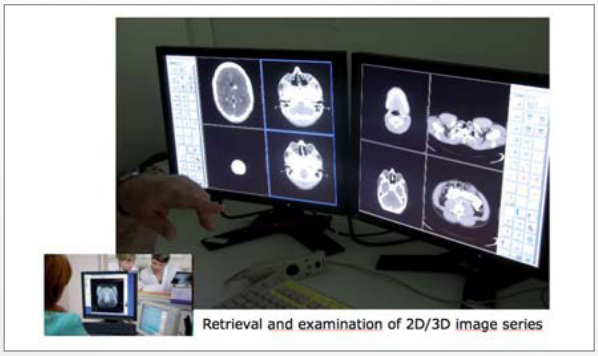
With traditional user interfaces, users may browse or explore visualized patient data, but little to no help is given when it comes to the interpretation of what is being displayed. Semantic annotations should provide the necessary image information, and a semantic dialog system should be used to ask questions about the image annotations while engaging the clinician in a natural speech dialog. Our motivation in developing RadSpeech is the design and implementation of a multimodal dialog system for the radiologist. Dialog-based semantic image retrieval and annotation form the basis for help in clinical decision support and computer aided diagnosis.

Functional principle of the interactive diagnosis form

With RadSpeech, we aim to build the next generation of intelligent, scalable, and user-friendly semantic search interfaces for the medical imaging domain, based on semantic technologies. Ontology-based knowledge representation is used not only for the image contents, but also for the complex natural language understanding and dialog management process. With the incorporation of higher-level knowledge represented in ontologies, different semantic views of the same medical images (such as structural, functional, and disease aspects) can be explicitly stated and integrated.

A radiologist's daily task in the SIEMENS patient image finding stations as installed at the University Hospital Erlangen defines the application scenario. Before everything else, we strive for more efficiency during the medical finding process and for more structured finding reports including semantic image annotations.

The CeBIT Demo „Interactive Paper", presented as part of Theseus MEDICO at the booth of the Federal Ministry of Economics and Technology (BMWi, Hall 9, Stand B47), shows new multimodal interaction possibilities of the



dialog system. In cooperation with Markus Weber and Dr. Marcus Liwicki from the Knowledge Management department at DFKI, the interactive paper for radiology findings has been developed. With the help of a special pen and handwritten annotations, structured radiology findings can be produced according to a medical ontology.

Project partners
Siemens AG
FAU Klinikum Erlangen

More information
www.dfki.de/RadSpeech

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