

ERmed

Erweiterte Realität in der Medizin

**Daniel Sonntag, DFKI
Siemens, Neuperlach 04/12/2013**

Daniel Sonntag (interaction design und usability), Markus Weber (doctoral student, gesture interaction), Takumi Toyama (doctoral student, eye tracking), Mikhail Blinov (graphic design), Christian Schulz (doctoral student, dialogue systems), Matthias Hammon

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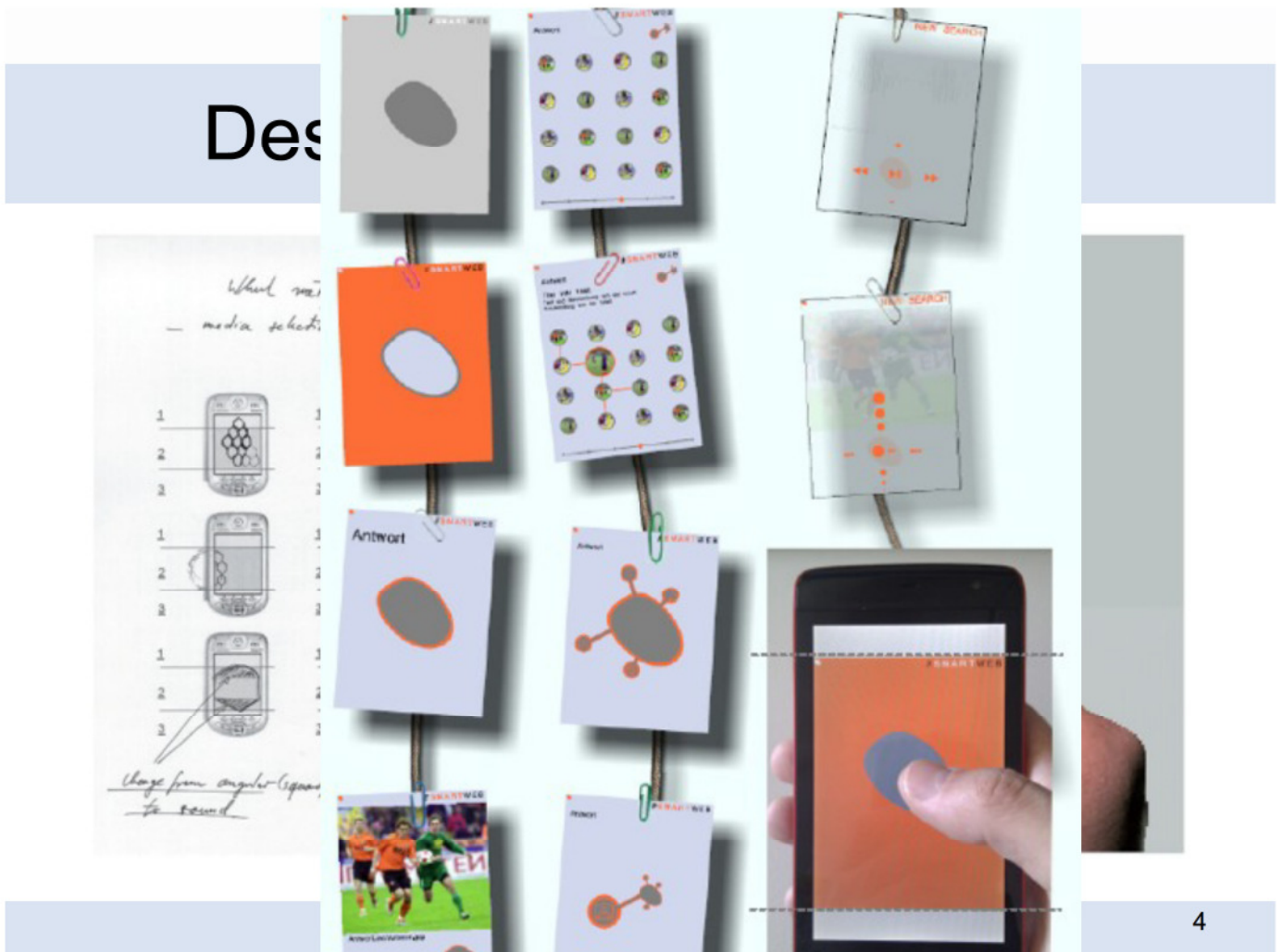
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Thumb Design Study



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PAST

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SMARTWEB

Wer war 1990 Weltmeister?

Anno 2007

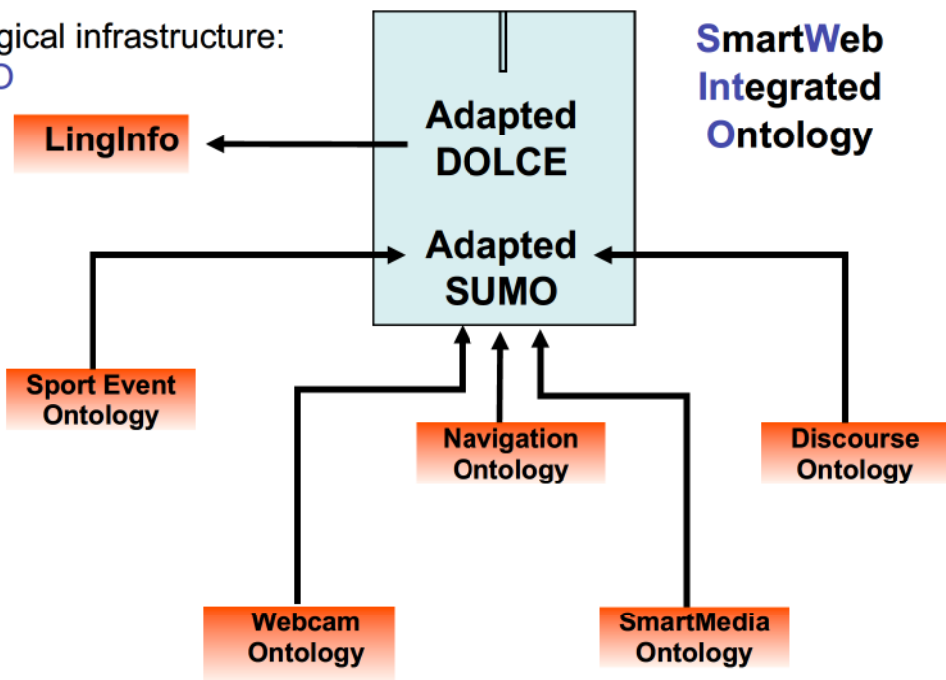


“Question Answering” Functionality

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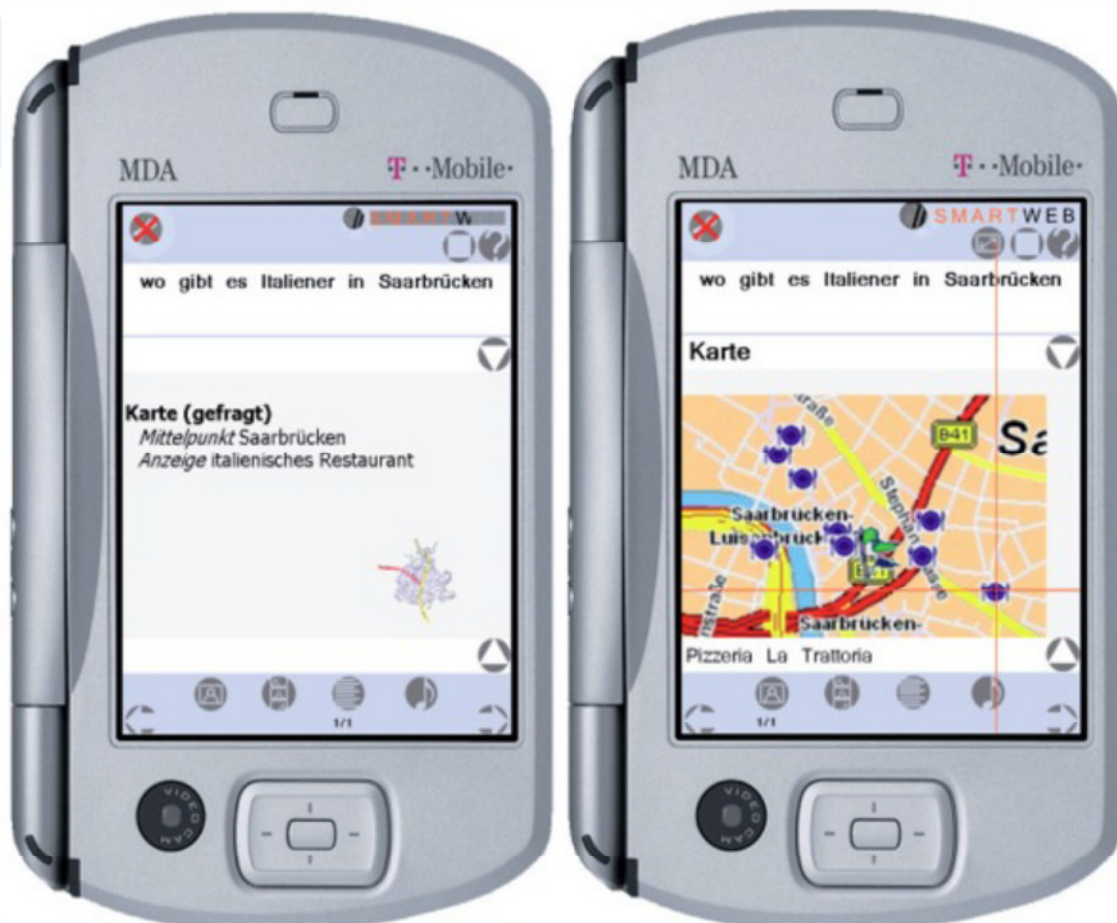
Ontologies

Ontological infrastructure:
SWIntO



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Siri Patent

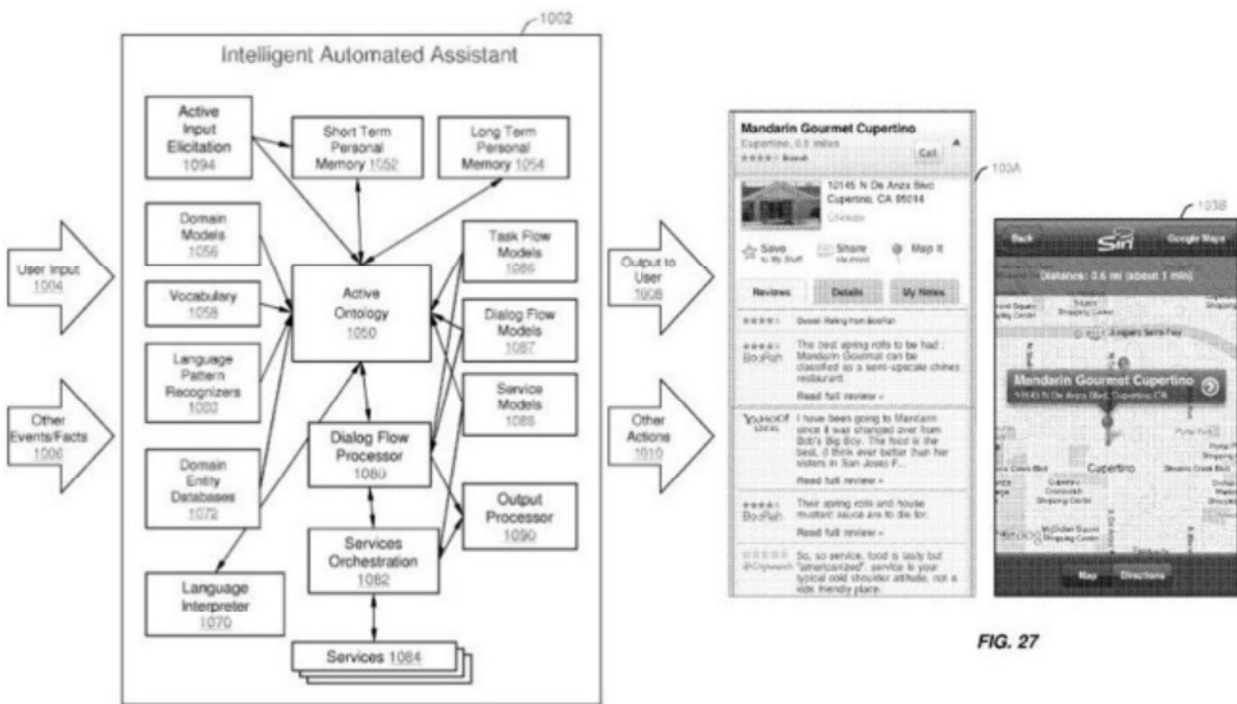


FIG. 27

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Technical Design

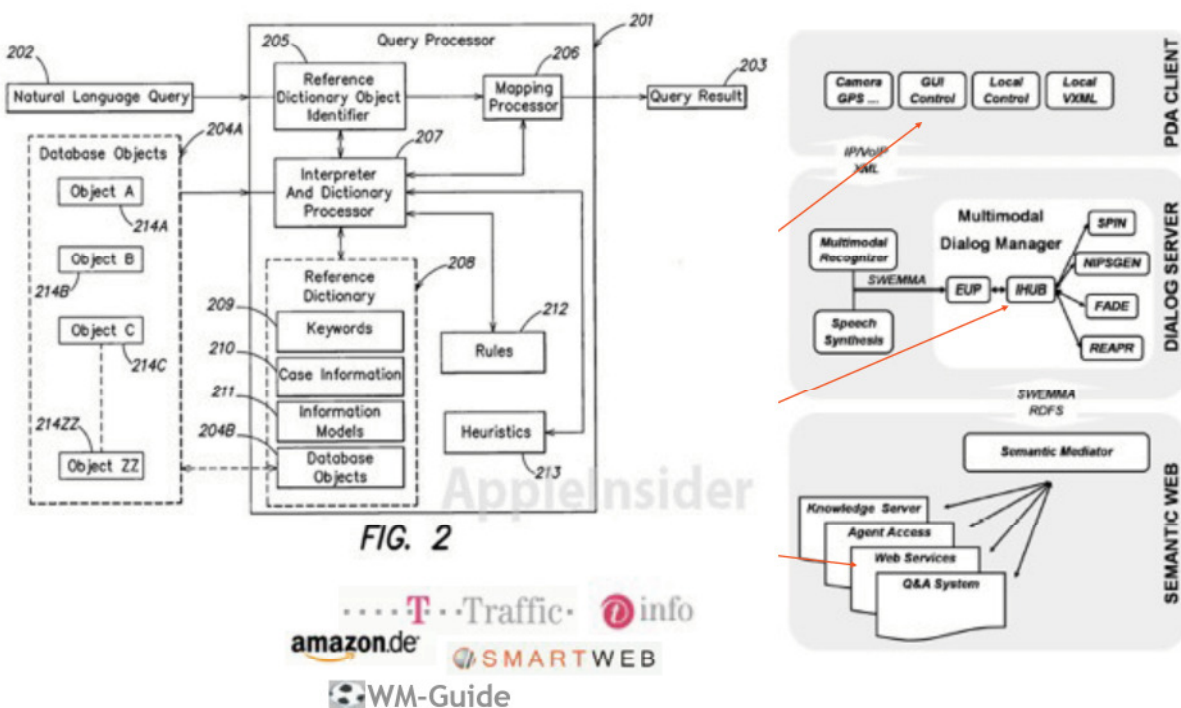


FIG. 2

.....T·Traffic· info
amazon.de SMARTWEB
WM-Guide

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2006 WM Demonstrator

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Detect and communicate uncertainties in the results.
Provide processing feedback and explanations.



U: "Now I would like to know who built Castle Charlottenburg."

S: "It's not in my knowledge base. I will search the Internet for a suitable answer. Empty results are not expected, but the results won't be entirely certain." (600 ms)

S: "I think it was built by Johann Nehring and Martin Grünberg." (10000 ms)

Upon request, SmartWeb reveals its sources of information.



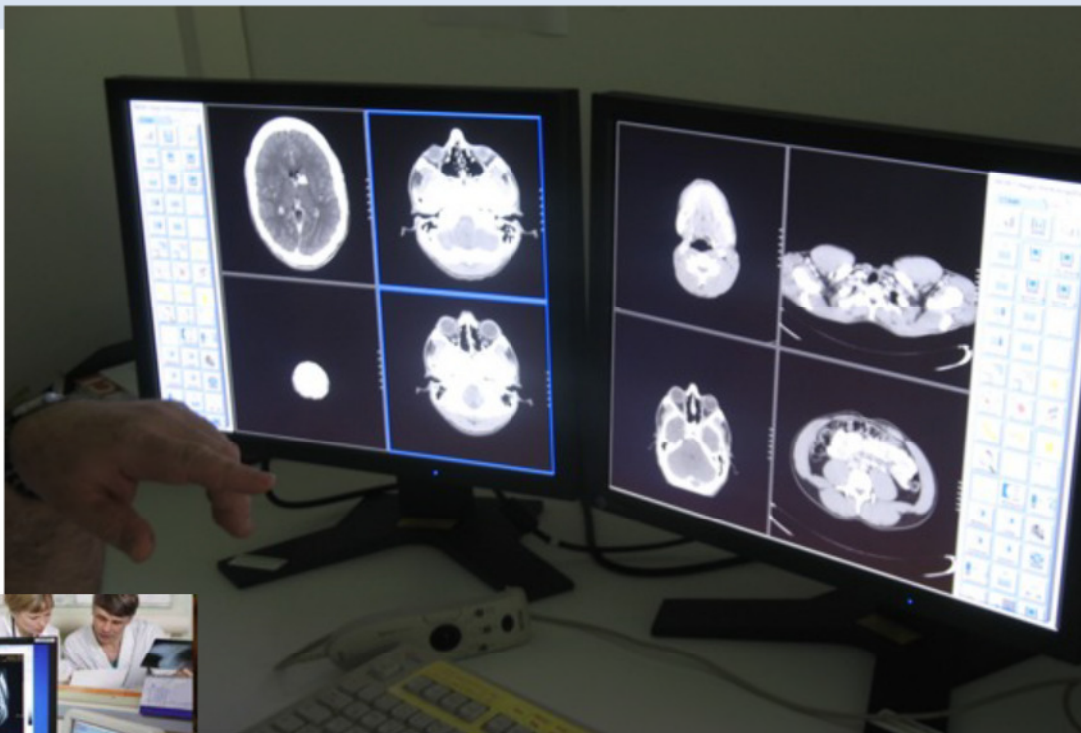
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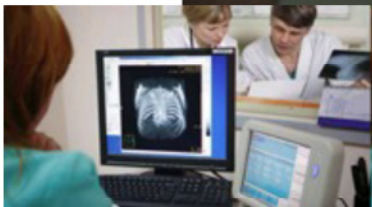
PRESENT

Image Analysis and Speech Dialogue

MEDICO RadSpeech

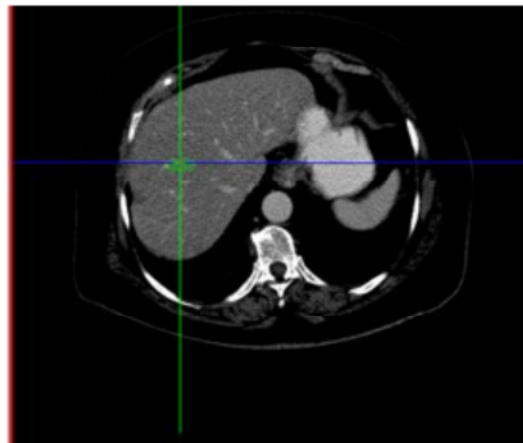
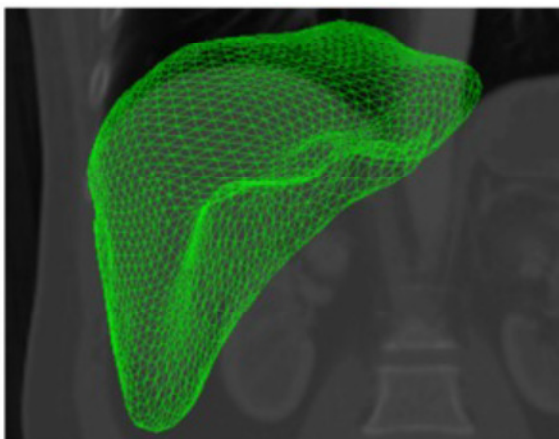


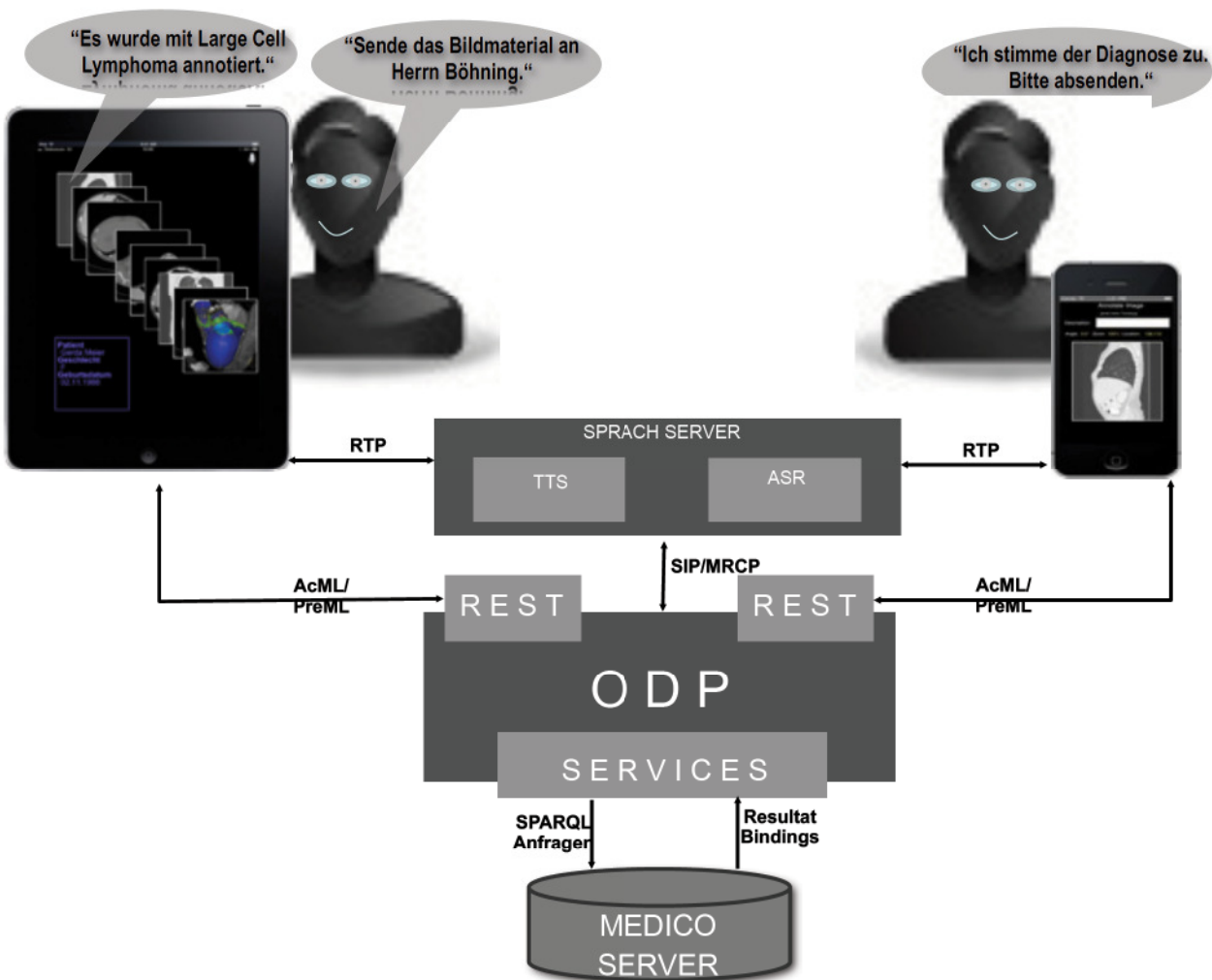
Retrieval and examination of picture series



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Semantic Annotation and Search of Similar Lesions





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German High Tech Award 2011



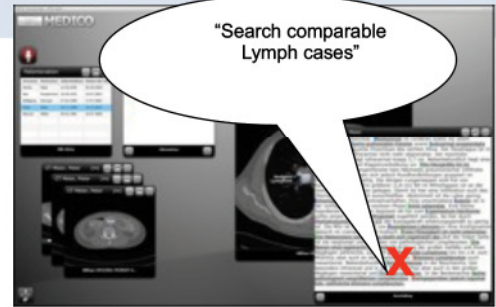
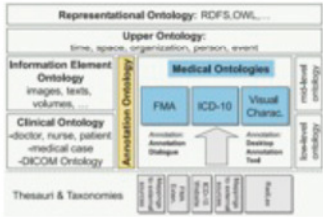
- Make dialogue-based radiology image reporting possible
- Reduce turn-over times and annotation errors
- Facilitate structured reporting

With the iPad's FDA approval, a breakthrough for mobile medical imaging, especially in the U.S., can be expected. With RadSpeech, we aim to build the next generation of intelligent, scalable, and user-friendly mobile semantic search and image annotation interfaces for the medical imaging domain.

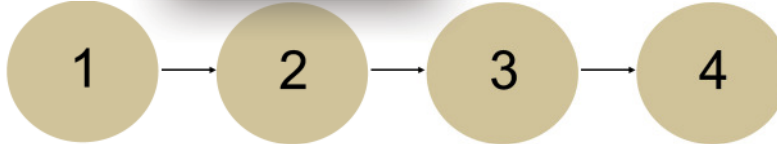
Incremental Knowledge Acquisition

Structured/Structural Knowledge

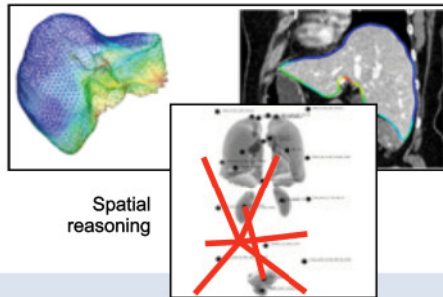
Desktop Annotation



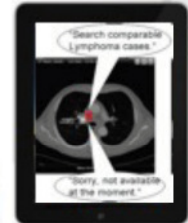
Dicom



Automatic Image recognition

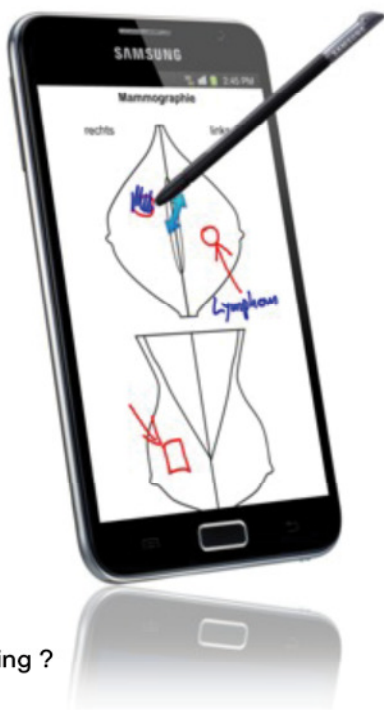


Spatial reasoning

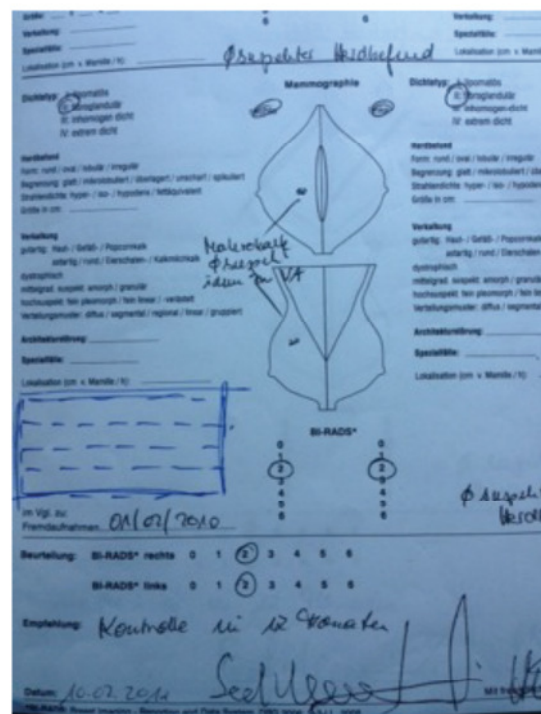


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Usability and Active User Input



Mobile Learning ?



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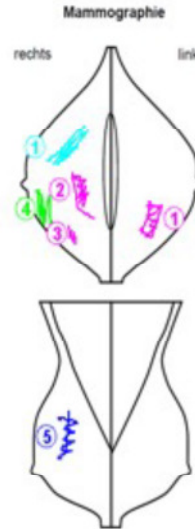
Digital Pen



Interaction

Erlangen Hospital, Department of Radiology		
Patient: M. Müller ID: 36716263861	Image: DCIM1489 Series: S-3454-13-08-10	Referring physician ID: 9938 Date of Issue: 23.10.2010
Findings		
FMA	Radlex	ICD-10
<i>bd A / dsf / Drog auf vvi2 / Kanton / bams</i>		
Fatty liver: [Yes/No] Iron deposition: [none/diffuse/patchy] Gall bladder is [normal/abnormal] and there is intrahepatic or extrahepatic biliary ductal dilatation [Yes/No] Rim enhancement [Yes/No] Other cysts / cystic masses: [Yes/No]		

Gestures:



Rechts

ichtetyp:
 I. lipomatös
 II. fibroglandulär
 III. inhomogen dicht
 IV. extrem dicht

irrbefund
 rm: rund / oval / lobulär / irregulär
 igrenzzug: glatt / mikrolobuliert / überla
 rahlendichte: hyper- / iso- / hypodens- / in
 öse in cm: 7,3

irkalkung
 artig: Haut- / Gefäß- / Popcornkalk
 antartig / rund / Eierschale

strophisch
 itelgrad: suspekt: amorph / granular
 chsuspekt: fein pleomorph / fein li
 iteilungsmuster: diffus / segmental / in
 chtelkürstörung:
 iczialfälle:
 ikalisation (cm v. Mamille / t): 2, 18
 Rad.

Second annotation
 Third annotation
 Pro who -

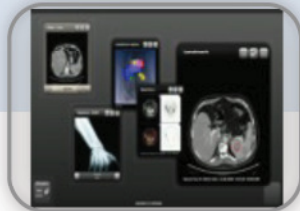
FUTURE

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Erweiterte Realität in der Medizin

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RadComet



DigitalPen



RadSpeech



ERglasses



MediVa

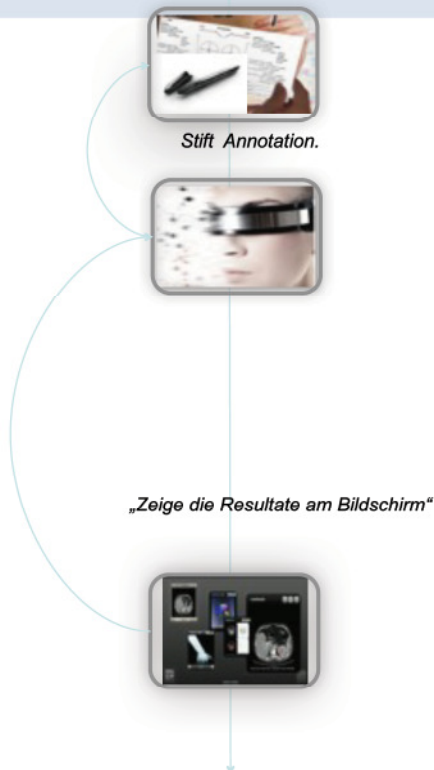


SmartPen

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Augmented Reality



ERmed - Ambie Arbeiten (Huma

Ästhetik
Perzeption
Mentales Modell
Soziale Umgebung
Entscheidungsunter
Multimodale Dokume
Entscheidungs-Feed
grounding)

Synchronisierte

Menschliche Informa
Menschliche Reaktio
Entscheidungsfindung
Multimodalität
Interaktivität

Mobile Intelligenz als Arbeitsumgebung:

Arbeitsgedächtnis und Arbeitsumgebung
Erweiterte Kognition



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Ermed Concept



Erweiterte Realität schließt erweiterte visuelle Möglichkeiten mit Projektionen auf Brillen, die Dateneingabe mit digitalem Stift und natürlichen Sprachdialog mit digitalen Assistenten mit ein. Es entsteht ein natürlicher multimodaler Dialog für mobile Medizinversorgung. Wir stellen intelligente ambiente Umgebungen für den Arzt bereit, damit dieser sich optimal auf den Patienten einstellen kann.

Sponsoren

SIEMENS

brother.

SMI TUM
SensoMotoric Instruments TECHNISCHE UNIVERSITÄT MÜNCHEN



Universitätsklinikum
Erlangen



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