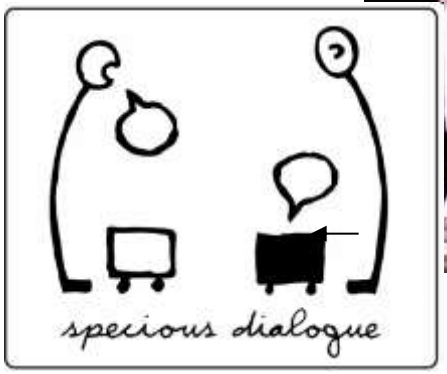
Digitale Welt und digitale Assistenz

Who was world champion in 1990 ?

Bitkom-Akademie
17/10/2013
Daniel Sonntag,
DFKI



“Search for more songs of <u>this</u> artist.”

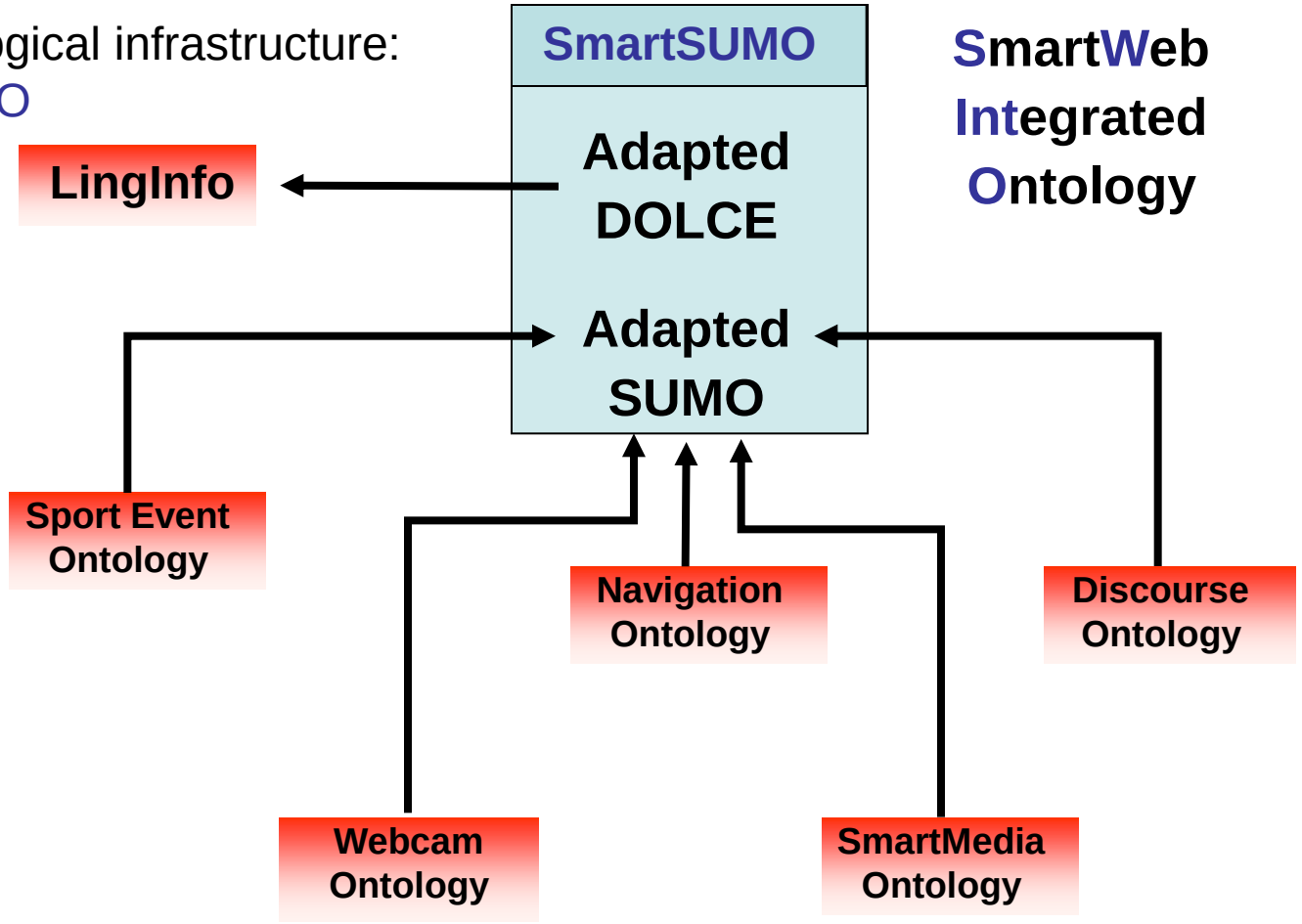
Who was world champion in 1990 ?

Anno 2007

Question Answering Functionality

Ontologies

Ontological infrastructure:
SWIntO



SmartWeb Integrated Ontology


MDA
T··Mobile·
wo gibt es Italiener in Saarbrücken
Karte (gefragt)
Mittelpunkt Saarbrücken
Anzeige italienisches Restaurant
1/1
MDA
T··Mobile·
SMARTWEB
wo gibt es Italiener in Saarbrücken
Karte
B41
Saarbrücken-
Pizzeria La Trattoria
1/1

Siri Patent

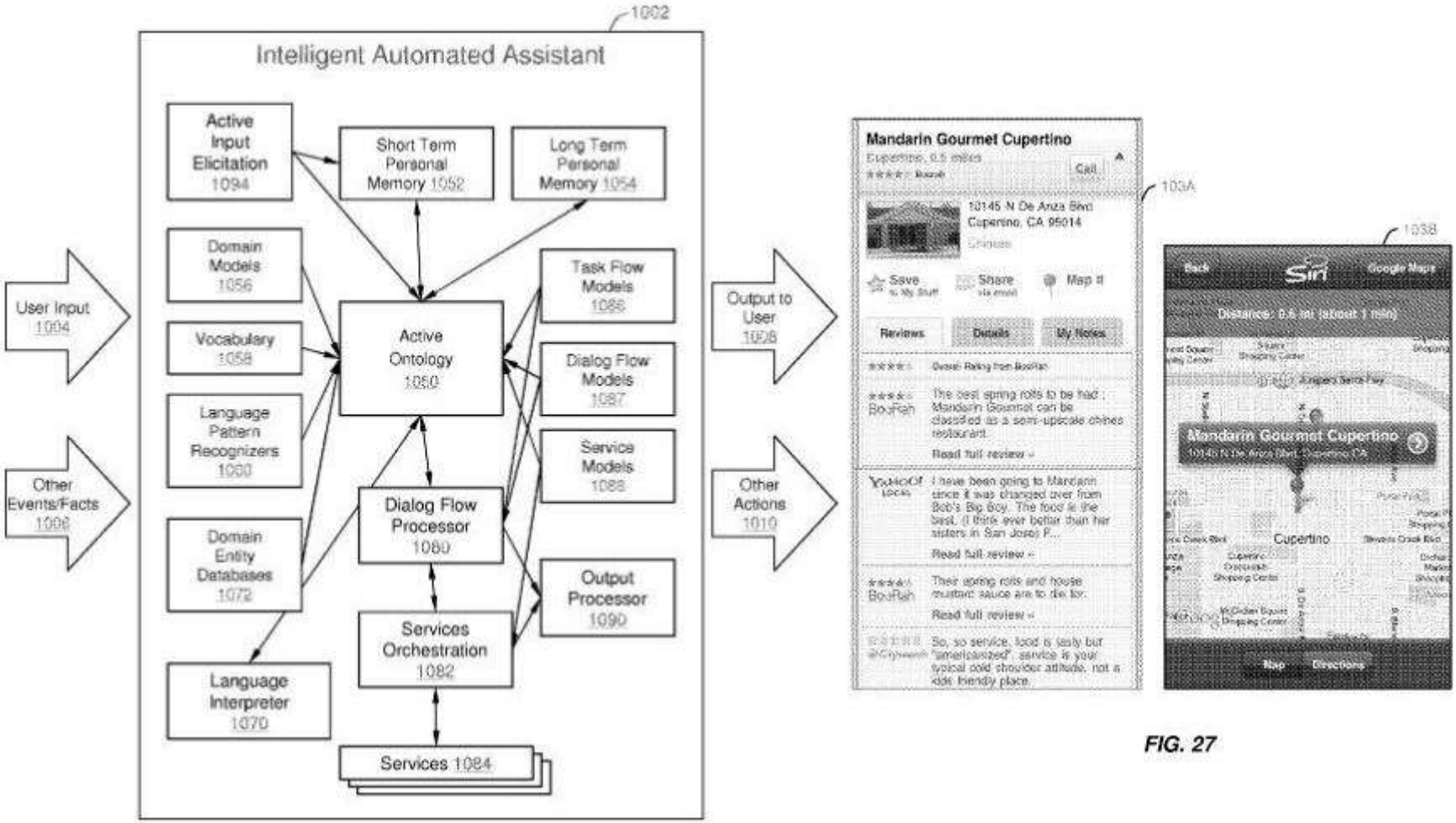


FIG. 27

2006 WM Demonstrator

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

Deutsche Telekom

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.

SMARTWEB


Mobi
Life
Life goes mobile!

Thumb Design Study

RadComet

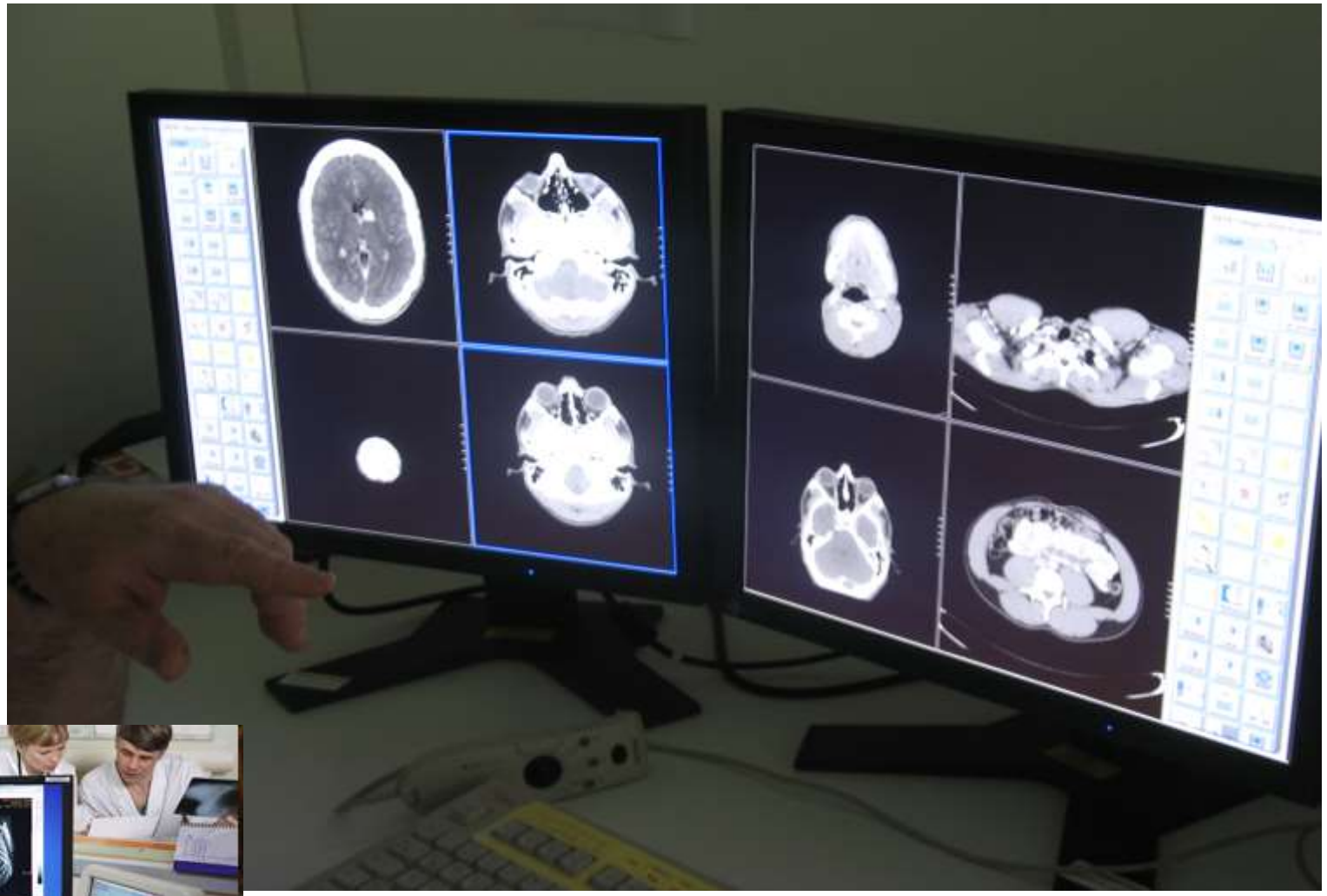
DigitalPen

RadSpeech

ERglasses

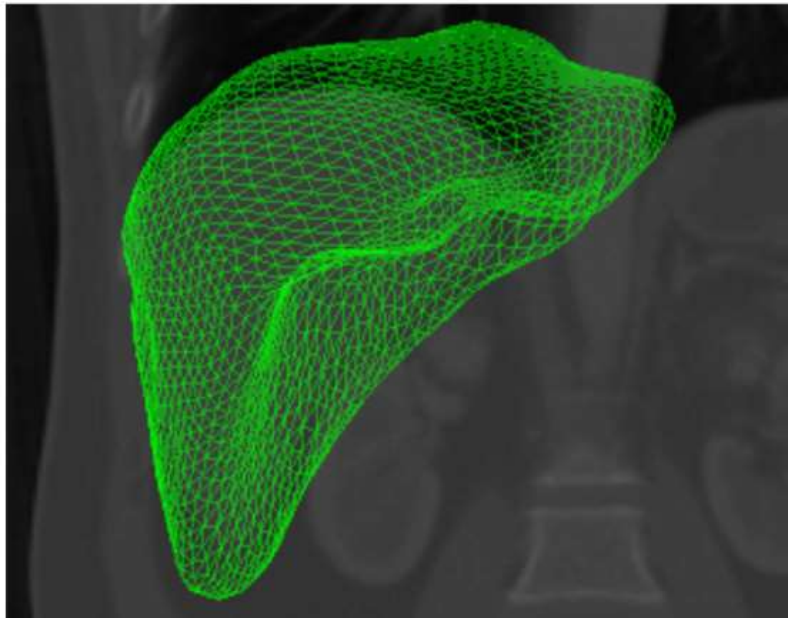
MediVa

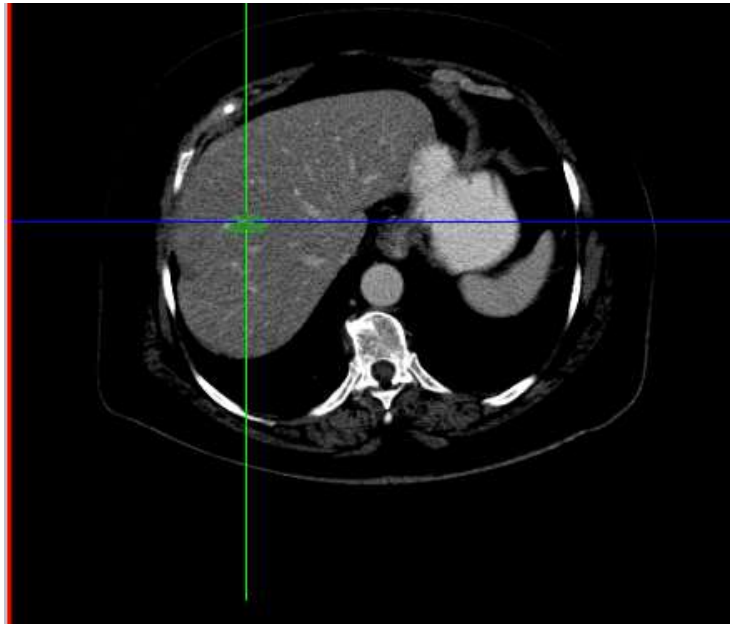
SmartPen



Retrieval and examination of 2D/3D image series

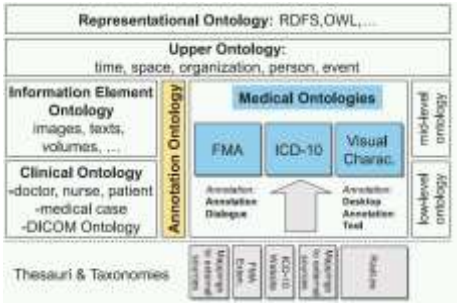
Semantic Annotation and Search of Similar Lesions



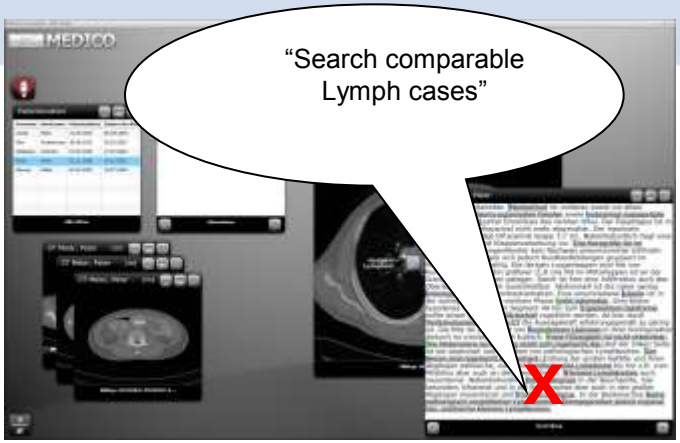


Incremental Knowledge Acquisition

Structured/Structural Knowledge



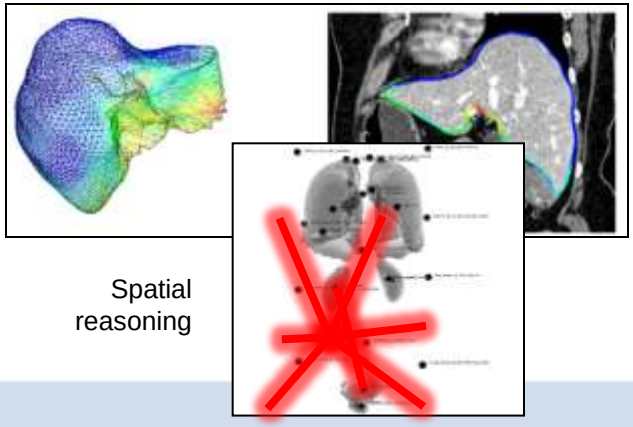
Desktop Annotation



1 → 2 → 3 → 4

Dicom

Automatic Image recognition



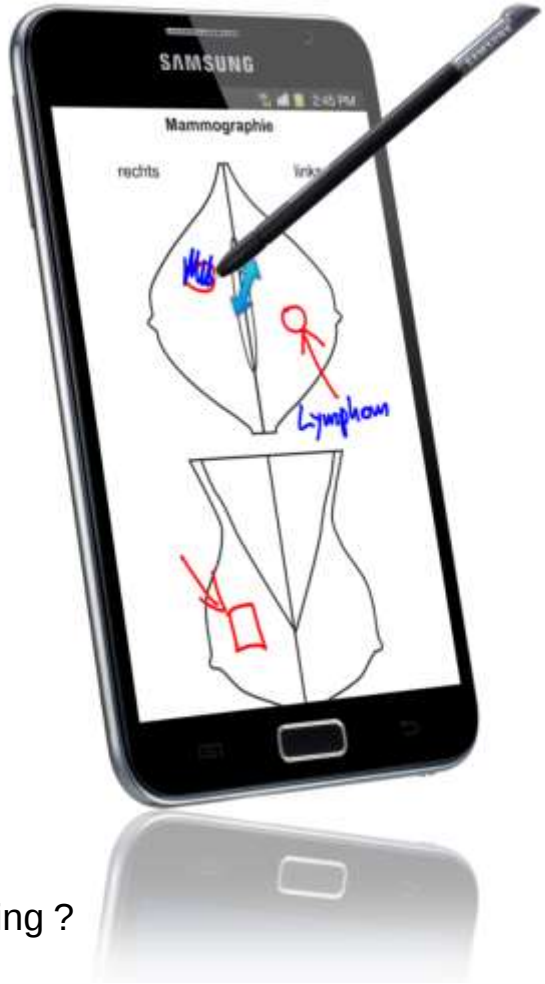
Spatial reasoning

German High Tech Award 2011

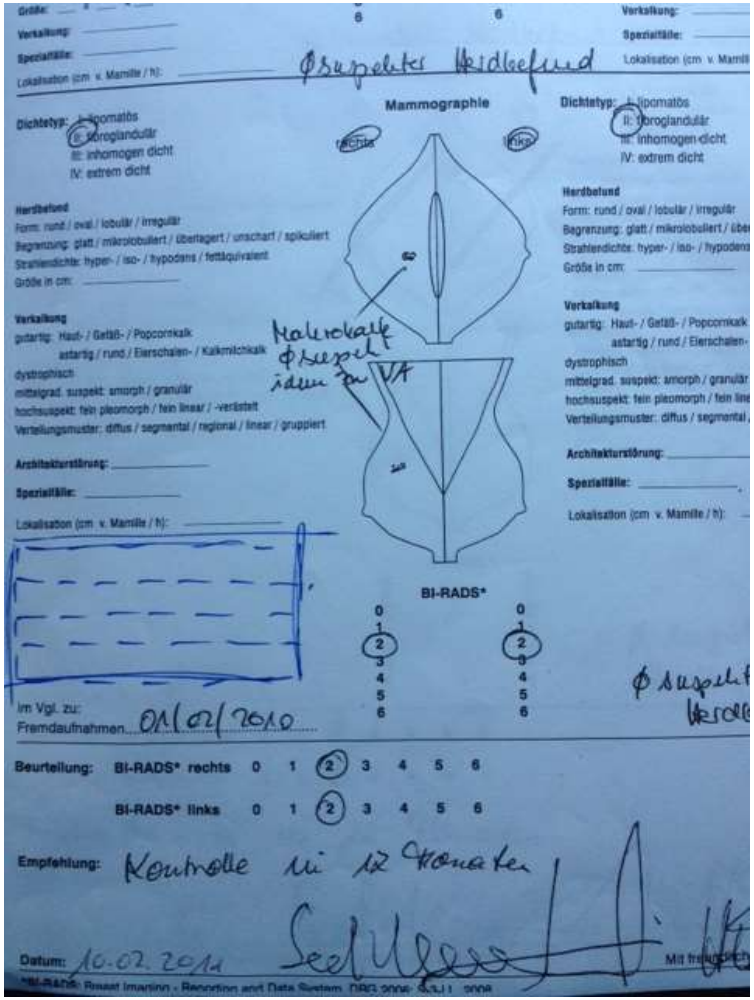
- Make dialogue-based radiology image reporting possible
- Reduce turn-over times and annotation errors
- Facilitate structured reporting

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.

Usability and Active User Input



Mobile Learning ?



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

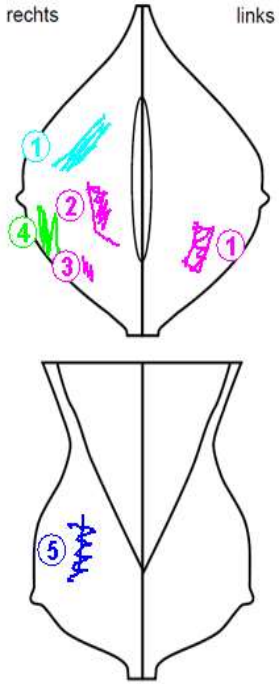
FMA	Radlex	ICD-10

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:

digipen technologies

Mammographie



Rechts

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

erdbefund
rm: rund / oval / lobulär / irregul
egrenzug: glatt / mikrolobuliert / überla
rahlendichte: hyper- / iso- / hypodens- / fe
öße in cm: 7.8

erkalkung
tartig: Haut- / Gefäß- / Popcornkall
astartig / rund / Eierschale
strophisch
ttelgrad. suspekt: amorph / **granulär**
chsuspekt: fein pleomorph / fein li
erteilungsmuster: diffus / **segmental** / r
chtitekturstörung:
ezialfälle:
kalisation (cm v. Mamille / h): **2 , 14**
Rad:

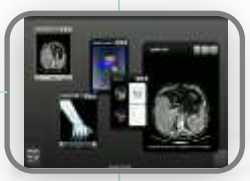
Second annotation
Third annotation
t=o who -

Finalist Cebit Innovation Award 2012 (6 von 80)

Augmented Reality

Stift Annotation.

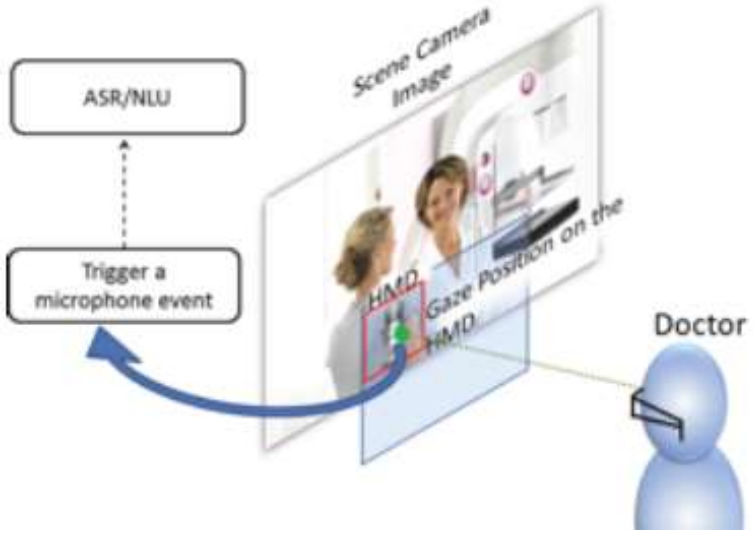
„Zeige die Resultate am Bildschirm“



ERmed - Ambientes
Arbeiten (Human Asp
Ästhetik
Perzeption
Mentales Modell
Soziale Umgebung
Entscheidungsunterstützung
Multimodale Dokumentation
Entscheidungs-Feedback u
grounding)
Synchronisierte Echtzeit-Erweiterung:
Menschliche Informationsaufnahme
Menschliche Reaktionen
Entscheidungsfindung
Multimodalität
Interaktivität
Mobile Intelligenz als Arbeitsumgebung:
Arbeitsgedächtnis und Arbeitsumgebung
Erweiterte Kognition

Cognitive Enhancement

Der Faktor Mensch ist einer von vielen Faktoren, industrielle Assistenz-Systeme zur kognitiven Verstärkung und physischen Entlastung erfolgreich in Medizinanwendungen zu integrieren.



Mobile Eye Tracker

Mobile HMD

Lessons Learned

- IUI Integration zum richtigen Zeitpunkt (Forschung-Industrie-Spannung)
- Zulassung (Approval)
- Eingebettete Intelligenz und Umgebungsintelligenz
- IUI = Digitale Welt (KI) und Digitale Assistenz (HCI)