

RadMiner | DATA MINING IN RADIOLOGY REPORTS

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averbis
text analytics

With RadMiner you have quick access to your entire text and image archive. You can save presumptive diagnoses, compile patient cohorts for studies and select case studies for your next presentation in real-time by means of a unitary web surface.

Text analytics of radiology reports

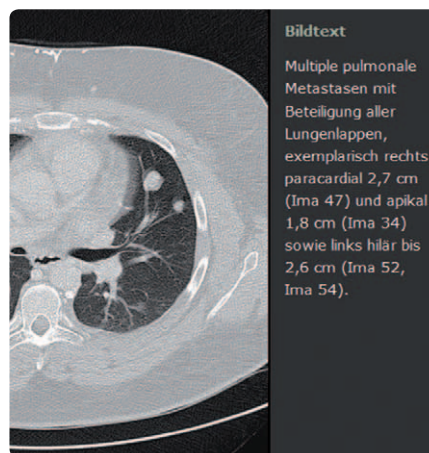
RadMiner enables semantic analysis of the radiology reports and recognizes key terms such as findings characteristics, presumptive diagnoses, anatomic terms and parameters. Negations which play an important role in radiological reports are also recognized and assigned reliably. RadLex, terminology published by the Radiological Society of North America (RSNA) for structured findings, is used as standardized vocabulary. It is translated into several languages making RadMiner a truly multilingual application.

Text and Graphics merge

Texts and images have until now been stored separately in RIS and PACS, solely linked together by a patient identifier. For the first time, RadMiner enables a semantic link between text- and image-related information. Relevant images are extracted from the radiological CT and MRI imaging data and linked with the corresponding text passages via image references in radiology reports, thus enabling access to the world of semantic databases: a reference compilation is created with high quality and substantial images, established by experts. Conventional X-ray and other techniques are of course integrated.

Semantic Search

Searches in RadMiner are carried out by the market-tested Averbis Search Platform, a search engine designed for the medical field which takes the particularities of medical language into consideration. These include the use of synonyms, the analysis and breakdown of composite medical terms in their components (e.g. „append I ectomy“), as well as the use of numerous useful filters, thus allowing the limitation of the search to certain modalities such as CT, MRT or CR. A selective search in the clinical information, the findings part and the assessment is also possible. Likewise, filtering according to certain organ regions such as “lung” or “liver” is integrated.



Your advantages at a glance

- Semantische analysis of your radiology reports
- Quicker and more reliable diagnosing
- Time and cost savings in clinics
- Improved patient care
- Support in teaching and research

Technical overview

- Based directly on your existing RIS/PACS system
- Platform-independent through service-oriented SOA architecture
- Easy integration in existing software applications
- Access via web-based graphic surface

Decision support in daily routine

RadMiner supports you with fast and reliable diagnosing at your workplace. With RadMiner, you can validate your presumptive diagnoses easily and effectively by means of comparison with similar cases, giving you access to your experienced colleagues' enormous knowledge pool. This saves valuable time and results in improved medical care of your patients.

The semantic analysis of the findings enables a series of further clinical applications:

- A demand-oriented review of indications is carried out by matching the clinical information with recognized guidelines, both minimizing patients' exposure to radiation and reducing costs in the Health Sector.

- The presumptive diagnosis can be matched with additional clinical data such as pathology and discharge reports, giving you valuable feedback on the accuracy of the diagnosis you compile.

High benefit in research and teaching

With RadMiner it is easy to select an extensive patient collection for clinical studies. Filter your data inventories according to clinical information, presumptive diagnoses, particular characteristics of findings, age, sex, and many other characteristics. A list of findings relevant to your study appears immediately. RadMiner furnishes valuable help, particularly for teaching. With just a click of a button, you can select the most relevant cases from an abundance of substantial images established by experts and integrate them in your next presentation.

"The early multi-stage process of patient selection for retrospective clinical studies is shortened considerably by RadMiner. With RadMiner, the relevant findings texts and graphics can be found within just a few minutes."

Prof. Dr. Kotter, Radiological University Hospital Freiburg

"RadMiner is an effective tool to copy non-standardized textual information to standardized terminology and to upgrade it by a semantic dimension."

Dr. Dirk Marwede, Radiological Practice Sanderbusch

"With RadMiner, presumptive diagnoses can be validated easily and effectively by the matching with preliminary findings. RadMiner thus offers a real added value for everyday clinic routines."

Dr. Alex Kuhn, Clinic & Polyclinic for Diagnostic & Interventional Radiology, University of Leipzig

"RadMiner is a valuable help for the semantic processing of radiological reports for our Semantic Server in MEDICO."

Dr. Sascha Seifert, Siemens Corporate Research and Technologies, Project Manager of the BMMi Research Project MEDICO

"We use RadMiner in our cohort studies on the risk of cancer in children following computer tomographies (KICT). RadMiner classifies many thousands of findings in stipulated groups of diagnostic findings, which saves enormous amounts of time and costs."

Prof. Dr. Blettner, Scientific Director IMBEI Mainz

The screenshot displays the RadMiner search interface. At the top, a search bar contains the text 'lungenmetastase' and a 'Radminer - Suche' button. Below the search bar, there are tabs for 'Bild', 'Text', 'Memo', 'Verlauf', and 'Order Entry'. The main area shows '19 Treffer in 115 msec'. Four search results are visible, each with a 'DICOM' and 'MEMO' icon and a corresponding CT scan image of the lungs. The first result is titled 'ausgeprägte pulmonale Metastasierung in allen Lungensegmenten. Die Metastasen sind im Vergleich zur Voruntersuchung'. The second result is 'Multiple pulmonale Metastasen mit Beteiligung aller Lungensegmente, exemplarisch rechts paracardial 2,7 cm'. The third result is 'Ubiquitäre pulmonale Metastasen in allen Lungensegmenten die gegenüber der Voruntersuchung größenprogredient'. The fourth result is 'multiphen pulmonalen Filiae, beispielhaft rechter OL (Ima 25 aktuell 3,3 x 2,8 cm VU 2,7 x 2,3 cm) und ML'. On the right side, a larger CT scan image is shown, labeled 'IMA 18'. Below it, there is a 'Modalität: CT' label and a detailed 'Überweisungsgrund' and 'Befund' section. The 'Überweisungsgrund' mentions 'Pulmonale Filiae eines adenoidzystischen Karzinoms oder Progress der pulmonalen Filiae'. The 'Befund' describes a comparison with a previous examination from 21.05.2008, noting 'ausgeprägte pulmonale Metastasen in allen Lungensegmenten. Die Metastase größenprogredient, exemplarisch Oberlappen (Ima 18) von 2 x 1, aktuell 2,4 x 1,9 cm; oder etwa'. At the bottom left, the 'averbis' logo is visible. At the bottom center, there are navigation icons '1 2 3 Weiter'. At the bottom right, the 'RADMINING' logo is displayed.

The research project RADMINING

RadMiner was developed in the research project RADMINING. The project is part of the Theseus Program, a project initiated by the Federal Ministry for Economics and Technology (Bundesministerium für Wirtschaft und Technologie). In RADMINING, specialists from the fields of Radiology, IT and Computer Linguistics developed a novel radiological knowledge system which facilitates the management of the increasing flood of medical images. RADMINING's goal is to optimize the work processes in the radiological environment, to support doctors in compiling clinical findings and scientists in carrying out studies. Averbis leads the project. The Freiburg and Leipzig University Clinics are also involved.

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About Averbis

Averbis GmbH is a specialist for text analysis solutions and present everywhere where companies must effectively search data, structure its content and carry out specific data analyses. Averbis offers special branch solutions for the health sector, the pharmaceutical industry, libraries and publishing houses. With the Averbis solutions allows information to be extracted from text collections and databases in no time and research processes to be automated. This reduces costs and increases the productivity in information management considerably, ensuring a decisive competitive edge for our clients.

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