

## Scandiags

# Musculoskeletal MRI: Artificial Intelligence for Clinical Image Interpretation

- Automatic interpretation of musculoskeletal MRI images,
- Use Cases: Real-time second opinion, peer review, retrospective quality review, case comparison, etc.
- Large catalog of detectable conditions (frequent and rare ones) currently being developed in cooperation with leading Swiss hospitals.
- Production-readiness expected during 2018.
- Selected early adopters receive the finalized solution license-free (platform fees still apply).

## Your Benefits

- **Globally consolidated radiology knowledge** improves detection rate for rare conditions.
- 7x24x365 availability of a solution that **never gets tired**.
- Substantial **cost savings** through automation of repetitive tasks during daily clinical work and while sharing knowledge and experience among experts.
- Retrospective **quality analysis** and peer reviews at minimal costs.
- Optional: Cross-referencing of **similar cases**, also across organizations.



## Facts and Details

- The ScanDiags project was initiated in 2016, after preliminary work since 2011. Initial prototypes were available in late 2016. As of May 2017, the project is in preview for two specific pathologies which are used during tests performed at participating institutions in Switzerland.
  - In cooperation with Swiss hospitals a catalog containing the majority of MRI-detectable clinical conditions and pathologies is being trained, with a goal for completion during 2018. Preview partners receive the finalized solution free of license costs (platform and maintenance fees still apply).
  - ScanDiags will offer recommendations and support during image interpretation. It won't provide any diagnosis and won't replace neither radiologists nor doctors.
  - ScanDiags is a modern implementation of artificial intelligence. It combines deep learning, traditional image and text analysis, manual (supervised) and automatic (unsupervised) learning and other concepts of machine learning.
  - During the A.I. learning process, ScanDiags uses pseudonymized MRI image data and pseudonymized corresponding text fragments of diagnosis reports. Identification of patients is prevented during the entire process.
  - For each participating institute an individual adaptation and partial training process is conducted. This allows the artificial intelligence to respect and correctly apply individual MRT sequence configurations and individual wording used at specific health organizations.
  - ScanDiags' A.I. doesn't rely on any rule-based system, but uses semi-autonomous learning, which allows for continuous quality improvements in the resulting neural network that contains the artificial intelligence.
  - When using ScanDiags during daily MRI operations, the ScanDiags process receives one or multiple MRI sequences (image sets) for one patient case, interprets the images and returns a report, including probabilities for the existence of certain conditions, into the RIS via an HL7 interface.
  - ScanDiags doesn't require any user interaction and doesn't affect a radiologist's established work process.
  - Finalized reports from radiologists and attending doctors are periodically reprocessed by ScanDiags. This feedback loop allows for ScanDiags' continuous learning and quality-improvement, which results in the online-availability of consolidated knowledge and experience from all globally participating institutes.
  - ScanDiags can include pathology reports into its learning process.
  - In peer review mode, ScanDiags analyzes a set of patient cases and returns statistical information about the accuracy of the clinical reports that were produced during the manual diagnostic process.
  - The optional scenario of referencing similar cases implies storing pseudonymized image and report data together with a pointer to a source institute. If a similar case is detected by ScanDiags, the system indicates a case number and a source institution. Based on this information, a customer can inquire at the source institution about that specific case. ScanDiags doesn't directly provide any personalized or person-identifiable information.
  - ScanDiags communicates with PACS and RIS systems through standardized APIs, such as DICOM and HL7.
  - ScanDiags can run locally in a customer's data center or in the cloud in Microsoft's Azure data centers. The latter allowing for the consolidation of distributed knowledge and experience in one location.
  - The update process for new releases of ScanDiags' artificial intelligence can be controlled by each individual customer. The process involves re-examination of a predefined set of reference cases that the customer designates, followed by automatic comparison of pre- and post-update results.
  - The quality of the training data that is used to build ScanDiags' artificial intelligence is independently reviewed through a thorough quality review process.
  - ScanDiags doesn't store any patient or customer data. The images that are submitted to ScanDiags aren't stored permanently but disposed of after the analysis process. Any data transmitted to ScanDiags is stripped of person- or customer-identifiable information.
- The ScanDiags software solution is developed by Balzano Informatik AG, in Zurich, Switzerland, a software company with 20+ years of experience in designing and implementing commercial solutions that leverage artificial intelligence.
  - Balzano is a gold certified partner of Microsoft.
  - The ScanDiags solution carries the „Swiss Made Software“ quality label.