



LEAD THE WAY
TO THE FUTURE OF RADIOLOGY
BE A PRESENTER AT RSNA 2023!

[Print this Page for Your Records](#)

[Close Window](#)

Control/Tracking Number: 2023-SP-165-RSNA

Activity: Scientific Presentations

Current Date/Time: 2/26/2023 3:47:54 PM

Open access AI tools in clinical support roles - an example of shoulder implant recognition

Author Block: Wolfram A. Bosbach, MD, PhD; Bence Nemeth; Jan Felix Senge; Lukas Ebner, MD; Suzanne E. Anderson, PhD; Pawel Dlotko; Keivan Daneshvar Ghorbani, MD; Johannes T. Heverhagen, MD, PhD

Abstract:

***Purpose:** Uptake of novel artificial intelligence methods into clinical tools is slowed down by multiple factors. One is the lack of access to computing facilities. In this study, we test today's open access resources for performing a musculoskeletal 4-class labeling task.

***Methods and Materials:** The tools we chose are Google-Chrome as browser, Google-Drive as online repository, Google-Colab as running environment. The model was implemented in Python, specifically Google-TensorFlow. The code was run on a deliberately unbalanced dataset with X-ray images containing implants from four different shoulder implant manufacturers. We applied a fine tuning on the Google-EfficientNet, the dataset was enlarged for training by data augmentation.

***Results:** We show that today's available open access resources are suitable for the intended task. Google-EfficientNet can be trained to perform the class labeling. Accuracy and avoidance of overfitting are improved by the data augmentation.

***Conclusions:** We will make the designed tool available as open access tool on github. Remaining issues today are the data safety and data privacy. Future tools will need to address those if sensitive data is supposed to be processed.

***Clinical Relevance/Application:** Identification of unknown implants is only one of the many clinical applications. The relevance of our work is to demonstrate a pilot that uses remotely open access tools for AI work. In the future, support tools could be designed to assist a radiologist in his daily clinical routine.

Category (Complete): Musculoskeletal Imaging -> MKHOI - Hardware and Orthopedic Implants

Format Preference (Complete): Electronic Poster in slide-show (pptx) format

Questions (Complete):

Trainee Research Prize: Resident/Physics Trainee

Disclosure of "Off-Label" usage: No, I do not intend to discuss off-label uses

IRB / IACUC Response: Not applicable/None of the above (explain)

If needed, please explain: : We use an open source dataset from UC Irvine.

Has this work been previously presented or published?: Yes

If Yes, please indicate where previously presented: : Swiss Congress of Radiology (SCR) 2023

2nd Format Opportunity: Yes, I would be interested if accepted to showcase my work in an additional format (2 meter Hardcopy Backboard).

Attached Files: No Files Attached

Status: Complete

Feedback