Stefan Klein

Short Biography:

Stefan Klein is Associate-Professor in Medical Image Analysis and is heading the Biomedical Imaging Group Rotterdam (BIGR), Department of Radiology and Nuclear Medicine, Erasmus MC, Rotterdam/NL. He also has a position at Health-RI as Imaging Community Manager. In 2002, Stefan received his MSc degree from the faculty of Mechanical Engineering at the University of Twente, Enschede/NL. In 2008 he obtained his PhD degree at the Image Sciences Institute, UMC Utrecht/NL, for his research on optimisation methods for medical image registration. He was co-principal developer of a widely used open-source software package for medical image registration, called Elastix (article cited >3500x), co-organiser of the CADDementia, TADPOLE, and KNOAP2020 grand challenges, general chair of the WBIR2018 conference, and serves as Associate Editor for the IEEE Transactions on Medical Imaging. His current research interests include image reconstruction, radiomics, machine learning, and disease progression modelling. He is also active in setting up infrastructures for research and has for instance initiated a national research archive for medical imaging data, currently used by numerous multi-centre imaging studies in the Netherlands. Publications: https://scholar.google.nl/citations?user=iaAFK0MAAAAJ

Abstract:

Emerging artificial intelligence (AI) techniques based on machine learning, such as radiomics and deep learning, hold the promise to turn medical images (such as X-ray, CT, MRI, PET, Ultrasound) into objective and quantitative biomarkers, optimally guiding diagnosis and treatment. In the field of medical image analysis, machine learning has become the main workhorse in automating any image processing task, ranging from low-level operations like segmentation to high-level interpretations such as diagnosis, subtyping, and prediction. However, machine learning is a "data-hungry" approach: the computer needs vast amounts of clinically representative example data to learn models that generalise well to new data. Therefore, efficient workflows for data gathering, anonymisation, harmonisation, storage, sharing, annotation, processing and integration are necessary to accelerate personalized medicine research. To this end, several national and European initiatives aim to develop an infrastructure that unlocks health data for reuse in research.