

AI applications in routine clinical imaging

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PROPOSITIONS

belonging to the thesis

**AI applications in routine clinical imaging:
detection, segmentation, diagnosis, and prognosis**

Akshayaa Vaidyanathan

28 February 2023

1. Quantitative analysis of medical imaging data can provide complementary information to aid physicians in the decision-making process, in a fast and reproducible way (this thesis).
2. Automated and/or semi-automated Radiomics and AI based methodologies can produce generalizable performance on segmentation, detection and classification tasks overall equivalent to that of an expert human charged with the same tasks (this thesis).
3. Quantification of known radiological semantic features of the region of interest can be a stepping stone towards the clinical xAI (this thesis).
4. Explainable medical imaging AI needs human-centered design (Chen, H., Gomez, C., Huang, CM. et al).
5. On an average, the expert users (radiologists) are more likely to prefer model-generated segmentations over manual segmentations (this thesis).
6. Features extracted from automatic segmentations had a better reproducibility than those extracted from manual segmentations (Parmer et al).
7. Phantom study could help to investigate the influence of image acquisition parameters on radiomic feature values (this thesis).
8. A combination of AI and an expert reader will surpass the individual performances of an AI and an expert reader (this thesis, Christian Leibig. et al).