

Shortcut learning for AI-based liver lesion diagnosis on MRI



Research Line: Artificial Intelligence for Integrated Diagnostics (AIID)
Project type: Master Project
Approx. duration: 6 to 9 months

Project description

Within the Liver Artificial Intelligence (LAI) Consortium, we are collecting MRI and clinical data from patients with solid-appearing liver lesions. This data is collected in ten centers across Europe, the US, and Australia (figure) and is very diverse in the broad range of lesion phenotypes, characteristics of the patients, and MRI characteristics. Because of these variations in the dataset, there is a risk of shortcut learning during the development of an AI-model for liver lesion diagnosis.

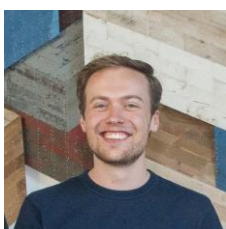


It is quite common for medical imaging datasets to contain spurious correlations: correlations in the training data that are predictive of the target label but are not causally related to the underlying task. AI-models have been shown to exploit these correlations, which is known as shortcut learning. This is very undesirable because it would mean that the AI-model bases the diagnosis on non-clinically relevant imaging features, such as image acquisition artefacts, instead of clinically relevant imaging features, such as the ones a radiologist would use.

As part of trustworthy AI-model development, we want to detect and quantify potential spurious correlations, or shortcuts, in our dataset and want to assess to what extent an AI-model picks up on these shortcuts. Furthermore, we want to explore methods to mitigate this undesirable behavior, such as pre-training a model on public datasets.

During this project you will focus on:

- Investigating the potential shortcuts in the dataset
- Evaluating the exploitation of these shortcuts of a simple model
- Develop strategies to mitigate shortcut learning



Interested in this project?

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