



Master's Thesis Proposal: 3D Medical Image Segmentation Using SwinUNETR Architecture

Institut für Künstliche Intelligenz in der Medizin
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The Institute for Artificial Intelligence in Medicine (IKIM) provides students a unique opportunity to engage in cutting-edge research at the intersection of healthcare and artificial intelligence. Based at the University Medicine Essen and the University of Duisburg-Essen, it offers a collaborative environment for exploring AI technologies. Completing a thesis at IKIM not only aids personal growth but also allows students to make a meaningful impact on healthcare innovation. As part of our team, you'll collaborate with experts in medical imaging and machine learning. This includes sharing findings, contributing to research discussions, and working together to overcome technical challenges.

Project description:

The aim of the project is to perform medical image analysis using the cutting-edge Vision Transformer (SwinUNETR) for whole-body segmentation in CT images. This initiative seeks to accurately segment a broad spectrum of anatomical structures (144 classes using the autoPET challenge dataset), from tiny blood vessels to significant organs like the liver. The focal point of this role is to refine the SwinUNETR architecture, thereby enhancing its efficiency. Responsibilities include experimenting with various model configurations, employing innovative training methods, and addressing noisy labels to optimize performance across diverse segmentation classes.

Prerequisites:

Programming Skills: Mastery of Python programming is essential for developing and testing the model.

Deep Learning Knowledge: A solid understanding of machine learning and deep learning fundamentals, with experience in deep learning frameworks such as TensorFlow or PyTorch.

If you are interested in this thesis, please feel free to send us your CV and a transcript of your records.

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