Redefining MRI:
From Image to Insight

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SY03-1

Multi-Modal AI for Medical Image Analysis: Visual Prompting for Medical Image Segmentation

Boah Kim

Sungkyunkwan University, Korea

Accurate lesion segmentation is essential for proton therapy planning, yet it remains challenging in non-contrast CT due to poor lesion-to-background contrast. In clinical practice, radiation oncologists often refer to complementary imaging modalities, such as contrast-enhanced MRI, to accurately delineate lesions on non-contrast CT. Inspired by this workflow, this seminar introduces a multi-modal AI framework for medical image analysis that leverages complementary cross-modality information to improve lesion segmentation. In particular, I will present a visual prompting approach built upon the Segment Anything Model (SAM), where contrast-enhanced MRI provides visual guidance for segmenting lesions in non-contrast CT. The seminar will discuss how cross-modality feature integration enables more robust lesion representation in challenging imaging conditions and highlight the potential of multi-modal AI to improve the accuracy and clinical applicability of medical image segmentation.

Keywords: *Medical image segmentation, Segment anything model, Visual prompt, Multi-modality, Deep learning*