标题：Multi-organ MRI to pseudo-CT generation

详细描述：

In radiation therapy planning, CT images provide crucial tissue electron density information for dose calculation. However, CT scans expose patients to additional radiation. Although MRI images do not produce radiation, their unique signal characteristics require precise mapping to corresponding CT manifestations to ensure the effectiveness and safety of treatment. Therefore, generating high-quality pseudo-CT images from specific organ MRI data is of significant importance.

Our current work focuses on leveraging artificial intelligence technology, specifically deep learning methods, to enhance the quality of CT image synthesis from multi-organ MRI data in radiation therapy planning. Specifically, we are dedicated to developing a novel organ-specific attention mechanism (OSAM) to address the challenges faced by existing methods in capturing global dependencies and key features of multi-organ MRI data.

Our proposed method overcomes the limitations of traditional approaches by integrating OSAM into the network architecture, modulating the self-attention mechanism with unique prompts. This strategy leverages cues from different organs to provide additional spatial contextual information, enabling the network to learn feature representations specific to each organ, thereby enhancing the quality of pseudo-CT images. Experimental results on multiple organ datasets demonstrate that our method consistently outperforms other synthetic methods in pseudo-CT image generation.

Through this work, we aim to improve the quality of CT image synthesis from multi-organ MRI data, thereby helping to enhance the accuracy of radiation therapy planning, reduce patient radiation exposure, and optimize clinical workflows.