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국문 강연제목: 저선량 CT 영상 복원을 위한 자기지도학습 알고리즘
영문 강연제목: Self-supervised learning algorithms for low-dose CT image reconstruction

Abstract
Computed tomography (CT) is an X-ray imaging modality essential for accurate diagnosis and surgical planning. To reduce the patient's health risk related to radiation exposure, low-dose CT (LDCT) can be used, where CT scans are acquired with the lower X-ray tube current or sparse-view sampling. These conditions cause severe noise or streak artifacts in the reconstructed images, and deep learning approaches have been actively investigated to improve the image quality of LDCT in recent years. However, the requirement for a large amount of paired training data and limited generalizability to unseen data were identified as main problems in deep learning. This presentation introduces two self-supervised learning algorithms developed to deal with the data scarcity and generalization problems. The first algorithm is based on realistic image noise insertion and consists of noisier2noise training and progressive image denoising parts. The second algorithm is a self-supervised neural attenuation field for sparse-view CT image reconstruction, which is inspired from novel view synthesis using neural radiance fields.

Brief Biosketch
He received the B.S. and Ph.D. degrees in engineering from School of Integrate Technology, Yonsei University, in 2017 and 2023, respectively, with a focus on the development of deep learning-based image restoration techniques for low-dose computed tomography (CT). He is currently a Research Associate with the Department of Artificial Intelligence, Yonsei University. His research interests include weakly/self-supervised learning approaches for CT image denoising, artifact reduction, and novel view synthesis.