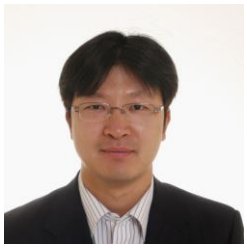

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강연제목: 저선량 CT 영상 노이즈 저감을 위한 CT 손실 함수 구현/ CT loss for low dose CT denoising

Abstract:

Convolutional neural network (CNN)-based denoising is an effective method for reducing complex computed tomography (CT) noise. However, the image blur induced by denoising processes is amajor concern.Themain source of image blur is the pixel-level loss (e.g., mean squared error [MSE] and mean absolute error [MAE]) used to train a CNN denoiser. To reduce the image blur, feature-level loss is utilized to train a CNN denoiser. A CNN denoiser trained using visual geometry group (VGG) loss can preserve the small structures, edges, and texture of the image.However,VGG loss, derived from an *ImageNet*pretrained image classifier, is not optimal for training a CNN denoiser for CT images. *ImageNet* contains natural RGB images, so the features extracted by the *ImageNet*-pretrained model cannot represent the characteristics of CT images that are highly correlated with diagnosis. Furthermore, a CNN denoiser trained with VGG loss causes bias in CT number. In this talk, we present a methodology to use a binary classification network trained using CT images as a feature extractor and newly define the feature-level loss as observer loss, which can produce natural low dose CT denoising compared to the cases with other loss functions.

Brief Biosketch

JONGDUK BAEK received the B.S. degree in electrical engineering from Yonsei University, Seoul, South Korea, in 2004, and the M.S. and Ph.D. degrees in electrical engineering from Stanford University, CA, USA, in 2007 and 2009, respectively, with a focus on the development of inverse geometry computed tomography (CT). He is currently an Associate Professor with the Department of Artificial Intelligence, Yonsei University. His research interests include image quality assessment using mathematical observer models, CT imaging systems, medical imaging processing, and low-dose CT with a deep-learning approach