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Corrigendum

CORRIGENDUM: Correction of a Table of Contents in Section 5

Deep Learning in Medical Imaging

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To the editor,

Thank you for publishing our article titled "Deep Learning in Medical Imaging" in volume 16 of December issue 2019. On page 663 of this article, we found a mistake in a table of contents at Section 5. The Section 5 should include 'IMAGE TO IMAGE TRANSLATION WITHOUT USING GENERATIVE ADVERSARIAL NETWORK' and 'Image to Image Translation With Using GAN' as subsections '1) Image to Image Translation Without Using GAN' and '2) Image to Image Translation With Using GAN.' At the time of submission, we checked this, but it missed at the publication. We forgot to check it at correction period. The mistake was not due to the editorial office of *Neurospine*. We attached an image with correction marking along with this letter to request correction of a table of contents in Section 5.

Your sincerely,

Namkug Kim

Corrected contents of Section 5

5. Image Transformation

History of image to image translation goes back to Hertzmann et al.[76] In this study, a nonparametric model was developed for texture analysis. However, more recent studies focus on using CNN. These studies can be classified into 2 categories including studies with or without GAN.

IMAGE TO IMAGE TRANSLATION WITHOUT USING GENERATIVE ADVERSARIAL NETWORK

1) Image to Image Translation Without Using GAN

Rise of an image to image translation cannot be separated from style transfer. Gatys et al.[77] used CNN for artistic style transfer. Gu et al.[78] changed loss and reshuffled feature vectors to transfer style. They argue that feature reshuffling can be a complementary solution for parametric and nonparametric neural network style transfer. Though their success of transferring style, overabstraction of features made these algorithms unrealistic. To overcome this hurdle, Li et al.[79] used wavelet transformation as well as multilevel stylization. Following this research, Yoo et al.[80] devised the wavelet pooling layer to enable photorealistic style transfer.

CNN can be used in image denoising. Jain and Seung[81] show frontiers of denoising technique using CNN architecture. They compared the performance of the Markov random field method to that of CNN and showed the CNN network can be used in denoising. Not only CNN but also autoencoder (AE) can be used in denoising. Vincent et al.[82] developed denoising AE, and they also developed stacked denoising AE as well.[83] Batson and Royer[84] used the concept of J-invariant and designed the Noise2Self concept. Interestingly, this is a single image-level denoising concept. Modality transfer can be also performed with the CNN network. Han[85] used an encoder-decoder network for MRI to CT to transfer modality.

1. Image to Image Translation With Using GAN

2) Image to Image Translation With Using GAN

Isola et al.[86] used conditional GAN to perform image to image translation with pixel to pixel correspondence. This model is called a pix2pix network. To overcome the limitation that requires pixel to pixel correspondence, Zhu et al.[87] designed CycleGAN architecture which does not require pixel to pixel correspondence. Though CycleGAN can be applied to unmatched

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