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Abstract

Convolution and deconvolution are two fundamental operations in the recent development of artificial intelligence. However, stability and efficiency are essential to the development of new learning methods. Although pseudoinverse reconstruction is a stable deconvolution technique, previous iterative or division in the Fourier domain is inappropriate for high-precision applications. Furthermore, pseudoinverse reconstruction through singular-value decomposition (SVD) requires excessive memory to save the singular vectors. In this study, we proposed a recursive deconvolution kernel using the pseudoinverse without SVD. We applied the deconvolution kernel to the PhysioNet electrocardiography (ECG) data with a Gaussian convolution kernel.