

## Transformation of Positron Emission Tomography Raw Data into Images for Classification Using Convolutional Neural Network

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**Abstract :** This paper develops the transformation of non-image data into 2-dimensional matrices, as a preparation stage for classification based on convolutional neural networks (CNNs). In positron emission tomography (PET) studies, CNN may be applied directly to the reconstructed distribution of radioactive tracers injected into the patient's body, as a pattern recognition tool. Nonetheless, much PET data still exists in non-image format and this fact opens a question on whether they can be used for training CNN. In this contribution, the main focus of this paper is the problem of processing vectors with a small number of features in comparison to the number of pixels in the output images. The proposed methodology was applied to the classification of PET coincidence events.

**Keywords :** convolutional neural network, kernel principal component analysis, medical imaging, positron emission tomography

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