

## Deepnic, A Method to Transform Each Variable into Image for Deep Learning

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**Abstract :** Deep learning based on convolutional neural networks (CNN) is a very powerful technique for classifying information from an image. We propose a new method, DeepNic, to transform each variable of a tabular dataset into an image where each pixel represents a set of conditions that allow the variable to make an error-free prediction. The contrast of each pixel is proportional to its prediction performance and the color of each pixel corresponds to a sub-family of NICs. NICs are probabilities that depend on the number of inputs to each neuron and the range of coefficients of the inputs. Each variable can therefore be expressed as a function of a matrix of 2 vectors corresponding to an image whose pixels express predictive capabilities. Our objective is to transform each variable of tabular data into images into an image that can be analysed by CNNs, unlike other methods which use all the variables to construct an image. We analyse the NIC information of each variable and express it as a function of the number of neurons and the range of coefficients used. The predictive value and the category of the NIC are expressed by the contrast and the color of the pixel. We have developed a pipeline to implement this technology and have successfully applied it to genomic expressions on an Affymetrix chip.

**Keywords :** tabular data, deep learning, perfect trees, NICS

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