Stacked Denoising Auto Encoder to Use Intermittency Chaos

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SUMMARY

Recently, deep learning is used as commercial services and it becomes hot topic. It is difficult to learn whole network, because deep learning has complicated network. It is known that giving good initial values in advance is effective for learning the whole network. Auto encoder is used to give initial values.

Auto encoder has three layers. They are input, hidden and output layers. The goal of the auto encoder is to obtain the output values to match the input values. The number of neurons in the hidden layer is smaller than those of input and output layers. When input data are sent to the hidden layer, they are moved to a dimensional space. This process is called dimensional reduction. So we can think of input layer as an encoder because it compresses data. Then, output layer as a decoder is try to reconstruct the original data by using relation between the hidden layer and the output layer. Also we use input data with the noise to obtain more robust value. This method is called denoising auto encoder and we obtain good values for deep learning [1] . Parameter a contrals the logistic map behavior. We set the parameter a as 3.828327 and use the intermittency chaos. We generate a random number by the logistic map and compare the number with the threshold. When it exceeds a threshold, it output 0. The output is multiplied by each pixel of the input data. The pixel which is multiplied 0 is painted black and becomes a noise. We use the logistic map for binarization. In this study, we forcus on weight in network due to difference of the number of neurons in hidden layer.

REFERENCES

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