MAXIMIZING A NEURAL NETWORK'S ACCURACY AND BOOSTING THE LEARNING PROCESS FOR DETECTING THE ABSOLUTE COLOR SIMILARITY BASED ON THE CENTROIDS OF NORMAL DISTRIBUTIONS

Sergiu Scrob, Inga Lisnic, Alexei Leahu

Technical University of Moldova, Chişinău, Republic of Moldova

sergiu.scrob@ati.utm.md, inga.lisnic@ati.utm.md, alexei.leahu@ati.utm.md

Artificial neural networks (ANN) are a method of performing machine learning in which a machine learns to perform a task such as the detection of the absolute color similarity by analyzing training examples as a data set. Training is the process of identifying the ideal set of weights for maximizing the accuracy

of a neural network. However, the training process depends a lot on the training data, so that if the data contains a lot of noise then the learning process will take longer time to converge to a result with a level of accuracy that is not guaranteed to represent the highest accuracy and a ground thruth. The training data used by us, consists from tuples of triplets with parameters such as R,G,B channels of the RGB color space and target labels of 12 color classes which indicates the absolute color similarity for one of them. Our aim is to demonstrate that the ANN is prone to converge faster and with a higher level of accuracy using training data where tuples of triplets also represents the centroids of those 12 color classes, considering each centroid as a pixel for a color class, and as a mean, mode, and median for a normal gaussian distribution, instead of using the training data consisting from tuples of triplets randomly chosen. By the centroid of f (x) we mean the point with abscissa $\langle x \rangle$ such that the area of the function times $\langle x \rangle$ is equal to the first moment [1]. Thus,

$$\langle x \rangle = \frac{\int x f(x) dx}{\int f(x) dx} = x_0.$$

References:

1. R. Bracewell. *The Fourier Transform and Its Applications.* 3rd ed. New York: McGraw-Hill, 1999 (pp, 139-140, 156).