

ABSTRACT

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The large volume of digital information in the form of images and videos on social networks demonstrates the need for the development of new techniques to extract relevant information from users. In this work computational intelligence and deep learning techniques are used to predict the interest of social network users in certain categories. Thousands of images are being posted to social networks daily, so classify images from social network users is a relevant process for businesses in the context of customer segmentation. Identifying the customer profile can help to define potential product consumers and create targeted advertisements. The technology applied consists of using Deep Learning and convolutional neural network optimization algorithms to develop different social image classification models. The performance of the following adaptive learning rate algorithms of artificial neural networks is compared: stochastic gradient descent, adaptive gradient descent, estimation of adaptive momentum and its variation based on the infinite norm and the mean square root of the gradients. The main objective of this work is to use the optimization algorithms to train convolutional neural networks and to verify if these methods are more efficient than the traditional training algorithms, such as Backpropagation and Gradient Descent. Of the 5 algorithms addressed, the adaptive moment estimation algorithm textit Adam demonstrates superiority reaching 94% accuracy of approximately 99% accuracy rate in certain image classifications proving to be the best algorithm for predicting interest profile.

Keywords: Convolutional Neural Networks; Deep learning; Optimization algorithms; Customer profile identification; Image Pattern recognition;