

Abstract— The Greek alphabet is a typewriting system developed by the Greeks in 1000 BC. The Greek alphabet also belongs to one of the ancestors of the writing system used in the modern era after the Latin alphabets, and to this day, the original Greek Alphabet still exists and uses some of its alphabets in mathematical formula equations such as alpha (α), beta (β), gamma (γ), and many more. Each of these symbols is now more commonly used in the mathematical formula theorems that many civilians recognize from the symbols. In its development, the researchers built a system of deep learning with the image classifier of the symbol using the CNN method. The research aims to learn how to implement CNN algorithms with softmax, SGD, and ReLU activation functions for image classification and to analyze the performance of the CNN Algorithm with the activation of softmax and SGD in the Greek alphabet symbol classification. In image classification, CNN was employed due to its proficiency in extracting intricate visual features, comprehending spatial arrangements, and preserving translational invariance. This enables CNN to proficiently capture crucial image-specific attributes, establishing its preeminence in image analysis and classification. The data set used is a two-dimensional image of the Greek alphabet symbol created with writing using the Microsoft Paint application. The collected data amounts to 1000 images, with 100 images per class, and has different resolution and size in each class. The data will then be divided into 70% training data, 20% validation data, and 10% test data. CNN method modeling built as many as nine models with four layers with different activation functions (different and previously defined), with one layer having a filter size of 64 and another layer having a matrix size of 2x2. The training process of the CNN model with the training data that has been equalized will have the optimal resolution. In the performance matrix analysis of the CNN model, it will later use the method of multiclass matrix confusion. The study highlights the significance of selecting appropriate activation and optimizer functions for enhancing classification model performance. While Softmax with Adam Optimizer and Sigmoid with RMSProp Optimizer yield positive outcomes, using ReLU in combination with the specified optimizers proves ineffective for this classification test