

## Modified hybrid genetic algorithm for training convolutional neural networks

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### Abstract.

This paper presents a modified variant of genetic algorithm for training convolutional architectures which reduces the execution time of the algorithm. Modification is based on changing the evolutionary segment of the algorithm by focusing on limiting the training time of each individual and incorporating the learnt knowledge of neuron parameters from the last generation into each new generation. By doing so the evolution is made more efficient, thus reducing the time needed to find the desired architecture.

Additional contribution of this paper is creating new dataset *DoubledMNIST*, which represents a successor of the popular MNIST dataset. Created dataset is doubled with respect to the MNIST dataset both in terms of the number of instances and in terms of the resolution of each individual instance. Results shown in the paper were obtained using the presented improved method on the created dataset. The paper also shows classification results on the said dataset.

**Keywords:** genetic algorithm; local search; convolutional architectures; MNIST dataset

### 1. Algorithm

The core idea of the genetic algorithm is to get a good solution to a problem by generating better and better solutions through the process of evolution. The evolution process consists of selection, mutation and crossover

test

### References

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