DEVELOPMENT OF A ROAD SIGN RECOGNITION SYSTEM IN UKRAINE

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Road signs are an important part of the road environment. They are designed to regulate the flow of vehicles, provide specific information to road users, or warn against unexpected road conditions. Detection and rapid recognition of traffic signs are crucial for driver safety. Currently, road signs in Ukraine are divided into eight groups: warning signs, priority signs, prohibition signs, regulatory signs, special signs, information indexes, service signs, and signs of additional information. Ukraine was one of the countries that signed the Vienna Convention on Road Signs and Signals in 1968, so Ukrainian road signs are included in the group of European signs, although they have some differences in color, the thickness of lines, and sometimes details of the picture. Therefore, in order to start development, it will be necessary to create a new dataset, which will consist of parts of datasets of European signs but selected for the current appearance of signs in Ukraine.

Currently, there are many approaches to solving the problem of road sign recognition [1–4], but most researchers prefer the use of neural networks and deep learning. The Tensor Flow library was chosen to work with the neural network. ReLu is selected as the activation function or transfer function for the second layer, and the softmax function is selected for the classification layer. The Adam algorithm was chosen to optimize learning. Adam is one of the most efficient optimization algorithms in training neural networks. It combines the ideas of RMSProp and the momentum optimizer. Instead of adapting the learning rate of the parameters based on the mean of the first moment (mean) as in RMSProp, Adam also uses the mean of the second moments of the gradients. The categorical cross-entropy loss function is chosen as the summary loss function.

Thus, the system can give a fairly high accuracy in the pictures, but for real-time recognition, some improvements will need to be made, which will be the subject of further research on the issue.

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