MSC: 68T99 Review article

The use of convolutional neural networks for automatic diseases detection tasks

M.A. Shereuzheva[1, 2], M.A. Shereuzhev[3], Z.M. Albekova[4]

[1]Institute of Computer Science and Problems of Regional Management –
branch of Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences
360000, Russia, Nalchik, 37-a I. Armand street
[2]Moscow State Technological University «STANKIN»
127055, Russia, Moscow, 1 Vadkovsky lane
[3]Moscow State Technical University named after N. E. Bauman
105005, Russia, Moscow, build. 5 corps 1 Baumanskaya street
[4]Institute of Digital Development, North Caucasian Federal University
350029, Russia, Stavropol, 2 Kulakov avenue

Abstract. This article provides an overview of existing convolutional neural network architectures and their application in the classification task for detecting diseases of fruits and plants. Diseases of plants and fruits are a serious problem in agriculture and horticulture, and their early detection can help in taking timely measures to prevent the spread and minimize damage. The results of the study can be useful for the development of automated systems for detecting diseases of fruits and plants, which helps to increase yields.

Keywords: neural networks, machine learning, convolutional network architecture, computer vision, image classification

Information about the authors

Shereuzheva Milana Arturovna, master, Department “Information technologies and computing systems”, Moscow Technical University “STANKIN”;

127055, Russia, Moscow, 1 Vadkovsky lane;

trainee researcher of the Laboratory “Intellectual Habitats” of the Institute of Computer Science and Problems of Regional Management – branch of Kabardino-Balkarian Scientific Center of the Russian Academy of Sciences;

360000, Russia, Nalchik, 37-a I. Armand street;

milana.shereuzheva@mail.ru, ORCID: https://orcid.org/0000-0002-6668-4703

Shereuzhev Madin Arturovich, senior lecturer, Department “Robotic systems and mechatronics”, Moscow State Technical University named after N.E. Bauman;

105005, Russia, Moscow, build. 5 corps 1 Baumanskaya street;

shereuzhev@bmstu.ru, ORCID: https://orcid.org/0000-0003-2352-992X

Albekova Zamira Mukhamedalievna, Candidate of Pedagogical Sciences, Associate Professor, Department of Information Systems and Technologies, Institute of Digital Development, North Caucasus Federal University;

350029, Russia, Stavropol, 2 Kulakov avenue;

zalbekova@ncfu.ru, ORCID: https://orcid.org/0000-0002-7214-8114