*MSC: 68T10; 68T45* Original article

# Prediction the yield of green crops based on monitoring morphometric parameters using machine vision and neural networks

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***Abstract.*** Artificial intelligence (AI) and computer vision tools play an important role in automatically determining plant growth stages. The study aims to analyze modern technologies for automatic analysis and measurement of plant characteristics such as height, leaf area and other morphometric parameters. This article discusses the use of computer vision and neural networks for monitoring morphometric parameters and predicting the yield of green crops. An algorithm has been developed for determining the growth stage, which collects data about plants using a multispectral camera and then analyzes the obtained information using neural networks. Training for growth stage classification was performed on a subsample of the original dataset, consisting of 273 randomly selected images maintaining class balance (91 images in each class). The training sample size for each class is 45 images, and the test sample size is 46 images for each class. Classification of growth stage showed high results: more than 95% of correctly recognized specimens; more than 93% correct recognition of individual growth stages. In terms of individual metrics (Precision, Recall, F1-score), the ResNet34 architecture performed best.

***Keywords:*** technical vision, neural networks, yield prediction, production automation

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