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ALGORITHMS OF AUTONOMOUS MOBILE ROBOTS

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Title: Algorithms of autonomous mobile robots

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INTRODUCTION

Mobile robots are increasingly used in agricultural production. Nowadays, there are many available solutions to identify obstacles with the subsequent stopping of vehicles (or mobile robots). Current solutions require the presence of a person in collision situations, which increases the cost of implementing the technological process. Proposals for autonomous mobile robots and inputs control algorithms are based on the conventional integrated sensors, and only a tiny sphere of research teams are working on a camera capturing and processing multidimensional images. So far, satisfactory navigation results and safe obstacle avoidance have not been achieved, where input information for the control algorithm is obtained from complex camera systems.

The onset of the era of computers and image digitalization, the development of the image processing and computer vision is moving fast. Research and development of algorithms aimed at understanding the image is mainly focused on technical, industrial and security applications, and only marginally agricultural work. Combining electronics, automation, image processing algorithms, and computer vision can practice as well as make equipment that will perform various agricultural work activities and tasks completely independently, without intervention, with feedback based on the image information. Such autonomous robotic systems can relieve and protect humans from monotonous and often mentally for human health, to claims of agricultural work.

At present, there are many elementary algorithms for obstructing obstacles, respectively to manage mobile robots in collision situations. However, these algorithms are only usable for a single typing operation and the ability to interact with algorithms and the common synthesis of different tasks is not currently solved. By combining image processing algorithms and algorithms for safe obstruction of obstacles (collision situations), it is possible to build a system that would be able to solve partial navigation problems, thus enabling the navigation of autonomous mobile robots between obstacles, thereby avoiding collision situations.

This publication brings new methods of image processing, navigation, localization, algorithmization and identification of specific objects that will be of importance in future practice and will contribute to the efficiency of the use of small autonomous robots in agricultural operations. This publication brings a new method proposed in image processing, navigation, localization, algorithms and identifying specific objects that will be important for future practice and will contribute to more efficient use of small autonomous robots in agricultural operations.

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