

**AMR – AN AUTONOMOUSLY ACTING ROBOT  
FOR LOGISTICS TASKS IN PRODUCTION**

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As the decades pass, more and more areas of human life are becoming automated, so people do not need to waste their time on the hand work. Automation covers all areas of modern production and implemented into plants, storehouses, chemical production, pharmacology and agricultural sector. Long time passed since humans have been working on fields, sowed and reaped. Today for the whole plantation we need just one man on the combine harvester and another one on the truck. But we still need to take care of the plants during the time they grow, and it creates some difficulties. But as technologies develop, soon the humanity will be able fully automate even such a painstaking work.

**This work aims** to tell about the concepts of the Contadino robots developed by the company “Continental” and their potential to be used in agriculture. The point is that in the past these robots were used in a fleet. They are designed to help people with the difficult and repetitive field work.

Soil compaction caused by heavy equipment is a problem in agriculture that can lead to declining soil quality and thus lower yields. The Contadino works autonomously in the fleet, serving as a sort of personal butler for each crop in the field. Thanks to an innovative satellite communication system (Real Time Kinematics Global Networking Satellite System) and networking with weather apps, for example, the autonomous robot can precisely target each plant to within three centimeters. In this way, with data on soil conditions and rainfall, each plant can be fertilized individually and yields increased in a resource-conserving manner. With the Contadino “Continental” provides a robust, reliable robotics platform with open software and hardware interfaces for which third parties can also develop individual working modules.

The autonomous robotic equipment carrier can be fitted modularly for a variety of agricultural uses, performing tasks such as monitoring the growth process of plants, precise weeding, or systematically sowing seeds and delivering nutrients. Camera-based, multispectral, or thermographic sensors are particularly important for monitoring plant growth or soil conditions. In this context, Contadino has the camera,

## **Платформа: ІНФОРМАЦІЙНІ СИСТЕМИ. КОМП'ЮТЕРНІ СИСТЕМИ ТА МЕРЕЖІ. ТЕХНОЛОГІЇ INTERNET OF THINGS ТА SMART-СИСТЕМИ**

radar and LIDAR know-how necessary for the safe operation of autonomous vehicles in the field.

Information from sensors forms the basis for calculating driving strategy and can be used for agricultural process automation. To connect the vehicle to the external environment – such as the cloud, other vehicles, or the surrounding infrastructure – Continental offers telematics hardware that is already designed to be compatible with the new 5G communications technology as well as the resources required to program the interfaces and software.

The second generation of the intelligent ProViu 360 surround view system will provide the driver with a panoramic bird's eye view of the machine in HD resolution on a touch display. At a later stage, ProViu 360 will become intelligent, allowing valuable additional information such as radar or tire pressure data to be fed into the system. Markings, pictograms, and written information will be superimposed directly onto the camera image, creating an augmented reality experience that can be viewed on the display. For example, the system can display information about the condition of the vehicle, such as tire pressure, as well as obstacles on the ground. This is displayed in an extremely realistic manner and highlighted in color on the screen. In addition, the company is also unveiling its VF TractorMaster Hybrid at the event. The intelligent tire is equipped with VF technology and sensors that continuously measures and monitors tire pressure and temperature. This is intended to increase productivity, yield, and operator comfort while reducing fuel consumption, tire wear, downtime, and maintenance costs. In addition to tires, rubber tracks with integrated sensor technology will also be on display.

**Conclusions.** There is no doubt that such technology will be highly needed in many countries. The knowledge of usefulness of sensors in areas where accuracy is important leads to the necessity to learn more about their functionality, the ways of their development. These perspectives will allow to improve their performance and invent new useful devices in order to make human life simpler.

### **R e f e r e n c e**

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