

# New sensor system ensures a safe harvest

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With the new system, harvesters automatically react to impediments in the field.  
Credit: CLAAS

Tractors and combine harvesters are frequently operated on difficult terrain. Crops such as canola and corn grow at different densities; the field is sometimes muddy and is rocky at other times; and plants often obscure the view of potential impediments. In order to enable harvesting

machinery to efficiently and safely harvest crops despite changing conditions, a new system for environment detection has been developed by Bielefeld University's Cluster of Excellence Cognitive Interaction Technology (CITEC) and CLAAS, an agricultural machinery manufacturing corporation located in Harsewinkel, Germany. The joint project is being funded as an innovation project within the it's OWL technology network. The results of the project have been presented on 24 October at a workshop in the CITEC Building.

The goal of the project was to develop a networked system with sensors that enables harvest machinery to automatically recognize its surroundings and react to changes. "In this way, the machines can adjust their operation based on the conditions of the field – both its state and the crops present," says CITEC researcher Dr. Thorsten Jungeblut, who coordinates the project together with Dr. Boris Kettelhoit from CLAAS.

Harvest machinery operators are often only able to see a limited area around the machines. Plants further obstruct what can be seen, and beyond this, the machines themselves limit the view: harvest combines are sometimes as long as a truck. "We therefore had to develop a system that ensures that collisions are prevented, for example with wild animals," says Jungeblut, an engineer who works in the Cognitronics and Sensor Systems research group at the Cluster of Excellence CITEC and in the Faculty of Technology at Bielefeld University. This group, headed by Professor Dr. Ulrich Rückert, conducts research on resource-efficient and micro-electronic systems, which are equipped with sensors such as color and infrared cameras, heat-detecting or distance sensors.

From July 2014 through the end of October 2017, the research group, together with CLAAS, developed the intelligent sensor network for electronic environment detection in agricultural harvesting machines. CITEC researchers also contributed algorithms that analyze sensor data to the project. "Sensor data is combined together and evaluated so that

the machine can assess the environment on its own, enabling it to adjust to changing conditions," explains Jungeblut. "In addition to this, the system works across different machines. For example, the control system in a combine harvester can warn a tractor of impending obstacles."

"This new system makes agricultural harvesting machinery more efficient and safer, thus increasing the quality of crop yields," says Dr. Boris Kettelhoit, from CLAAS. "Damage to people and [machines](#) is prevented to the greatest extent possible, and stoppages are reduced."

**More information:** For more information, see [www.its-owl.com/projects/innov...harvesting-machinery](http://www.its-owl.com/projects/innov...harvesting-machinery)

Provided by Bielefeld University

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