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Leibniz Centre for Agricultural Landscape Research (ZALF)

ZIM cooperation network on AI-based agricultural robotics launched:

Artificial intelligence for sustainable agriculture

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The recently approved ZIM cooperation network "DeepFarmbots" met virtually for its official kick-off on November 25. The central goal of the network is to develop and disseminate new agricultural robotics solutions for efficient and sustainable agriculture. In an interdisciplinary approach, agricultural robotics is to be linked with new deep learning methods and the synergy effects between the partners are to be deepened. The Leibniz Centre for Agricultural Landscape Research (ZALF) is participating in "DeepFarmBots" with research approaches to digitalization in agriculture. The network is funded by the Zentrale Innovationsprogramm Mittelstand (ZIM - Central Innovation Program for SMEs) of the German Federal Ministry for Economic Affairs and Energy. It brings together hardware and software developers, AI experts, research institutions and farmers.

AI-based agricultural robotics for efficient and sustainable agriculture - this is the full title behind the name "DeepFarmbots". Our agriculture is facing enormous challenges: Much of current agricultural production is based on intensive, industrialized farming. This practice is unsustainable, damaging soil, water and air, and is also coming under regulatory pressure. In addition, staff shortages are a major problem for many farms. In this context, the use of robots can make an important contribution during the transition to high-yield and sustainable agricultural production. By combining robotics with new approaches from artificial intelligence, the precision, capabilities and autonomy of robotic systems can be significantly increased.

ZALF brings to the project its many years of experience in the field of agroecology and in the development of new cropping systems. Prof. Sonoko Bellingrath-Kimura,

head of the "Land Use and Governance" Research Area at ZALF, is investigating how agriculture can become more sustainable and resource-efficient with the support of robots, digital measurement technology and information. "Great potential lies in the development of sensors and the linking of information on the ecological footprint of a product from the field to the consumer", explains Bellingrath-Kimura. "This will allow us to grow and manage in a more site-appropriate and small-scale way, which will ultimately help promote biodiversity and other environmental aspects."

The ZIM cooperation network "DeepFarmBots" brings together players from the fields of agricultural robotics, hardware and drives, sensor technology, IoT, AI, agroecology and agriculture. This results in a unique opportunity to comprehensively follow the development of agricultural robotic solutions across applications. The R&D topics to be pursued by the current 9 companies and 3 research institutions range from sensitive control and robust sensor technology for demanding environments to new machine learning methods for image processing, and swarm robotics. An important role is played by the exchange with the farmers involved in the network in order to incorporate the real needs and requirements from practice into the technical development.

ifectis Innovation Promotion guides the cooperation between the network partners. Network manager Tatiana Rothmann from ifectis makes the point that the network is open to further partners. Interested companies and research institutions that would like to be involved in R&D projects and can contribute complementary expertise are just as welcome as potential users of the newly developed solutions.

Network Partners:

- German Research Center for Artificial Intelligence (DFKI)
- farming revolution GmbH (agricultural robotics and AI)
- Leibniz Centre for Agricultural Landscape Research (ZALF)
- LUPA-Electronics GmbH (IoT)
- OndoSense GmbH (radar sensor technology)
- Othmerding Maschinenbau GmbH & Co. KG (agricultural machinery technology)
- Spacenus GmbH (remote sensing and AI)
- Toposens GmbH (ultrasonic sensor technology)
- W. Neudorff GmbH KG (environmentally friendly plant care products)
- WELLGO Systems GmbH (drive technology)
- The University of Münster ("Computer Vision and Machine Learning Systems" working group and Institute for Geoinformatics)
- Zauberzeug GmbH (robotics, software and AI)

About the ZIM cooperation network "DeepFarmBots":

The "DeepFarmBots" network is funded by the German Federal Ministry for Economic Affairs and Energy as part of the "Central Innovation Program for SMEs (ZIM)". In an interdisciplinary approach, intelligent robot systems for Agriculture 4.0 are being developed within the network. The focus is on linking agricultural robotics with new deep learning methods to increase the precision and capabilities of the systems. The synergistic relationships between the partners are also to be used in the subsequent marketing of the jointly developed products. There are currently eight SMEs, one other medium-sized company and three research institutions involved in the network. Network management is provided by ifectis Innovation Promotion – Dr. Björn Mamat.

www.deepfarmbots.net

About ifectis Innovation Promotion

ifectis Innovation Promotion – Dr. Björn Mamat advises companies from all sectors throughout Germany – from start-ups to medium-sized enterprises – on the conceptual design, implementation and financing of innovative projects using public funding. Its European partner network also enables it to provide support on funding and financing issues beyond Germany. The company has its headquarters in Lahr in the Black Forest. www.ifectis.de



Caption: Using agricultural robots to make cultivation in agriculture more resource-efficient: ZALF participates in the ZIM cooperation network on AI-based agricultural robotics. | The image is released for editorial purposes, provided the source is given: © Sonoko Bellingrath-Kimura | Image source in color and print quality: <http://www.zalf.de/de/aktuelles>

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About the Leibniz Centre for Agricultural Landscape Research (ZALF) in Muencheberg, member of the Leibniz Association:

Mission of ZALF is to deliver solutions for an economically, environmentally and socially sustainable agriculture –together with society.

As a contribution to overcoming global challenges such as climate change, food security, biodiversity conservation and resource scarcity, we develop and design crop systems, integrated in their landscape contexts that combine food security with sustainability. Therefore we process complex landscape data with a unique set of experimental methods, new technologies and models as well as socio-economic approaches.

ZALF research is integrated systems research: starting from processes in soils and plants to causal relationships on the field and landscape level up to global impacts and complex interactions between landscapes, society and economy. www.zalf.de