Gesture-controlled, autonomous vehicles may be valuable helpers in logistics and trans-shipment centers

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FiFi is controlled by gestures and carries small and big loads for the user. Credit: A. Trenkle / KIT

Transporting big boxes, holding shopping bags, or carrying suitcases to the plane or taxi: Often, we would like to have a second pair of arms for routine work. Many flows of materials and goods at factories and workshops take place manually. An electrical "gofer" is needed, which is

controlled by natural gestures, relieves the workers of heavy loads, and transports them independently. This is done by the assistance system FiFi of Karlsruhe Institute of Technology (KIT). It is now being tested in first industrial pilot applications.

"FiFi is an assistance system we developed to support man in his direct environment. It can be controlled in a contact-free manner," Project Head Andreas Trenkle, KIT, explains. The mobile platform equipped with a camera system is particularly suited for dynamic material flows at factories and workshops. These flows require high flexibility and are usually executed by man. Typical examples are high bay warehouses for car spare parts, consumer products of big online traders or deliveries of goods between departments of big companies.

So far, two versions of FiFi have been realized: One vehicle allows for the transportation of loads of up to 30 kg and has a base area of 50 x 50 cm. Another bigger vehicle developed by the industry partner Bär Automation can transport loads of up to 300 kg and even pull a cart. Via a camera system, FiFi three-dimensionally acquires the gestures of the user and executes his commands. For moving FiFi or switching into the different modes of operation, no contact is required. FiFi follows the user and may approach him up to an arm's length for loading. When the user points to a line on the floor, FiFi independently moves along the line to the next station, where it is deloaded by the next user. A safety laser scanner prevents it from colliding with objects or people and allows for safe operation. By a gesture, a lifting system can be adjusted to various working heights.

In a first practical test, FiFi was operated successfully. Now, the assistance system is planned to be commercialized in the area of intralogistics. Together with the industry partner Bär Automation, FiFi was optimized for various applications in the logistics sector. Now, other pilot applications are planned. "FiFi helps workers perform their tasks

more efficiently," Trenkle says. "It can also help design more workplaces in a senior-friendly manner by facilitating the transportation of light and heavy loads."

Provided by Karlsruhe Institute of Technology

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