Fraunhofer IML

Fraunhofer-Institut für Materialfluss und Logistik IML

evoBOT®

The evolution of autonomous mobile robotic systems

The Challenge

The concept of robotic systems that can perform a variety of tasks and are versatile has been around for a long time. While implementation had previously seemed like a distant dream, new technologies now offer opportunities and potential for the next generation of autonomous robotic systems.

A look at the robotic technologies available on the market makes it clear, that there is already a wide range of highly specialized solutions available at the present time. These systems are limited in their abilities and can only perform simple tasks. Examples of these include the transport of packages, the handling and movement of logistics goods and human-machine interaction. Since previous systems were designed for individual applications, this makes it difficult to use them for different applications outside of their original scope. Therefore, new robotic systems need to be obtained for every unique application, resulting in significant expenses. An innovative solution is needed to combine the isolated capabilities of previous systems.

On the basis of this concept, the Fraunhofer Institute for Material Flow and Logistics (IML) made the initial steps toward creating an all-encompassing robotic system: the evoBOT® was born.

evoBOT® – countless opportunities, beyond the logistic and industrial context

The solution

evoBOT® - one robot, countless possibilities
From concept to prototypical implementation: With evoBOT®, the employees at Fraunhofer IML managed to create a new generation of autonomous mobile robotic systems (AMR).

Constantly in balance
As a dynamic system, the evoBOT® is taking advantage of the principle of an inverse pendulum, without an external counterweight. Furthermore, open-source components were utilized in the development of the robotic system. The prototype was designed to be compact and lightweight. In contrast to conventional robots the evoBOT® will always keep its balance. This allows him to traverse various and eneven surfaces, even with inclines.

Highly versatile
The modular structured system extends the scope of application for this collaborative robot beyond the classical logistic situation into the complex urban space. A unique feature of the evoBOT® is its capability to pick up and deliver packages and container from the ground, as well as at and on different heights and surfaces. Hereby evoBOT® takes a step further than previous robotic solutions. In the future, the prototype will also be able to combine and complement individual capabilities, such as pushing and pulling of logistic goods.

Natural human-machine interaction
During the design process of the innovative prototype, great emphasis was placed on a bioinspired appearance. The special design will favor a natural human-machine interaction. The appearance of the robot can be customized to fit various applications and consider psychological aspects. This makes the robot the perfect assistant for humans.

Upcoming Developments

The robotic system is currently in the prototype stage. In the future, there are plans to further develop this system with a user (company) for the corresponding field of application.

You have a specific application for the evoBOT®? – We look forward to collaborate with you!

Further Informations

Fraunhofer Institute for Material Flow and Logistics:
https://www.iml.fraunhofer.de/en.html

evoBOT® Homepage:
https://www.iml.fraunhofer.de/evoBOT.html

Department IoT and Embedded Systems:
https://www.iml.fraunhofer.de/IoT.html

Image: evoBOT® in Action

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