New robot overcomes obstacles

July 29 2016

Ourobot. Credit: Bielefeld University of Applied Sciences

Students at Bielefeld University of Applied Sciences have developed "Ourobot". Their project was supervised by a professor at the Bielefeld University of Applied Sciences and a CITEC researcher.

It looks like a bicycle chain, but has just twelve segments about the size

of a fist. In each segment there is a motor. This describes pretty much the robot developed by the four bachelor students in Computer Engineering, Johann Schröder, Adrian Gucze, Simon Beyer and Matthäus Wiltzok, at Bielefeld University of Applied Sciences. The project was supervised by Professor Dr. Axel Schneider of the Bielefeld University of Applied Sciences and Jan Paskarbeit from Bielefeld University. A new video introduces the robot.

What distinguishes "Ourobot" from other comparable robots are the pressure sensors found in its chain segments which enable it to detect and overcome obstacles. The name of the robot, by the way, was inspired by an ancient Egyptian symbol depicting a serpent eating its own tail, the Ouroboros. "At the moment Ourobot can only move straight ahead and cannot manage curves yet, but its sensors can detect obstacles, such as a book, and can traverse them", explains Jan Paskarbeit. The control mechanism behind this, i.e. the way the individual chain links interact in order to roll over an obstacle, involves a complex mathematical task. "It is remarkable how the students have solved this", says Axel Schneider. The professor is a co-opted member of CITEC and leads a large project at the Centre of Excellence developing "Hector", a walking robot. "There is no concrete application for Ourobot at the moment. It is a feasibility study, meaning basic research", explains Schneider. This also makes the project exceptional, as bachelor's projects at the University of Applied Sciences are usually application-oriented. "However, this does not rule out fundamental research projects, quite the opposite, we integrate the students early into research projects", adds Schneider.

The collaboration with the University continues with the master's degree in BioMechatronics, jointly offered by Bielefeld University and the Bielefeld University of Applied Sciences. Matthäus Wiltzok, who worked on the project, is now enrolled in this course. He and his colleagues are infected by the "robot virus", and all are keen to continue working in this area.

A highlight for the team was the visit of the international robot conference ICRA in Stockholm which took place in May this year. The research paper on Ourobot was met with great interest there. There is a long way to go, however, before the project Ourobot is concluded, as it is continually in development. The supervisors' vision is to take the present robot that works in two dimensions "into the third dimension", as Schneider explains. "We would like to develop a robot that actively changes its form, which can adapt to its environment like an amoeba, capable of stretching and shrinking again", describes the professor. In this way, Ourobot can move through narrow terrain and overcome obstacles by means of different movements. The team has designed different variations of the new 3-D version of Ourobot, similar to a ball or a snake. In this area, however, there is still much research to do.

More information: Paskarbeit, Beyer, Gucze, Schröder, Wiltzok, Fingberg, Schneider (2016): OUROBOT – A self Propelled Continuous Track Robot for Rugged Terrain. In: Proceedings of the 2016 IEEE International Conference on Robotics and Automation (ICRA), Stockholm, Sweden.

Provided by Bielefeld University of Applied Sciences

Citation: New robot overcomes obstacles (2016, July 29) retrieved 25 April 2024 from https://phys.org/news/2016-07-robot-obstacles.html

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.