

### **Technology for people: Students from Karlsruhe develop posture trainer for shoulders**

- **COSIMA winning team from Karlsruhe Institute of Technology receives EUR 1,500 for StraightUp - a novel system that detects posture errors by measuring shoulder movement**
- **Second and third places, endowed with 1,000 EUR and 500 EUR, convince with energy-autonomous garden probe and shoe insole for early detection of foot strain errors**
- **A total of six applicant teams took part in students competition COSIMA in 2023 - the top 3 also receive tickets for the international iCAN competition in Davos in 2024**

(Dresden/Frankfurt a. M. Oct. 26, 2023) In contrast to many other competitions, the student competition COSIMA, organized by VDE as a project funded by the German Federal Ministry of Education and Research (BMBF), does not impose any specifications regarding the topic. In addition to a functioning prototype that demonstrates the benefits of microsystems technology for everyday applications, a marketing concept and the search for sponsors to finance the project are required. The winning team 2023 from the Karlsruhe Institute of Technology impressed the top-class jury from industry and universities with their project StraightUp.

#### **1st place: How shoulder movements can be used for a posture trainer**

In cooperation with a physiotherapist, the three-person team developed an innovative system for detecting posture errors in the back. StraightUp is able to determine the position of the shoulders, which provides more precise results than previously used solutions. The central component is a wearable that integrates a patent-pending sensor system made of 100-micrometer-thin wire. The elongation of the wire provides information about movements in the shoulders, and an integrated microprocessor converts the data and sends it to an app. Team

spokesperson Jan Bartenbach explains, "StraightUp has great added value for the user, but could also be applied for therapeutic purposes. We want to run for a startup grant and see if we can bring the product to market. Of course, this will also require the necessary medical studies."

### **2nd place: Energy-autonomous garden probe shows how the garden is doing**

The second-place team from the Albert Ludwigs University of Freiburg was already working on the development of energy-autonomous systems during their bachelor's studies. For COSIMA, the existing ideas were refined once again. The result is SolemSense, a solar-powered, energy-autonomous garden probe. Temperature sensors provide information about the temperature at three soil depths, another sensor determines the moisture in the soil, and a daylight sensor provides information about whether a plant is sufficiently supplied with light. Team spokesman Nicolas Brugger explains further plans: "It was fun to work out our project neatly for COSIMA, but of course we are not finished yet. Now the focus is first on the master's degree, but who knows, maybe we can sell our idea to a strong partner."

### **3rd place: When a shoe insert tells you if your posture is right**

Originally, the team from the Technical University of Munich wanted to make different gait profiles for athletes comparable. However, it quickly became clear that using a measurement system for early detection of foot misalignments and the associated back damage would have major medical benefits. The pressure-based, interactive shoe sole FlexiStep is divided into different zones and uses a pressure sensor and an acceleration sensor (MPU) to determine an individual gait profile. This data is transmitted to a server, evaluated and compared with a healthy gait pattern. Team spokesman Dominik Materne notes, "We developed our project for COSIMA and received a lot of suggestions at the MikroSystemTechnik congress about what we can improve about FlexiStep. We'll certainly be tweaking it, especially in preparation for the iCAN competition in Davos."

### **COSIMA: Innovations from universities**

Six teams presented their projects at this year's MikroSystemTechnik congress in Dresden, where the awards ceremony was held. For the first, second and third place winners, in addition to the cash prize at COSIMA, there is an invitation to the international iCAN competition, which will take place in Davos in 2024. There, the winners will be able to compare themselves with students from other countries, and so far the German teams have done very well. Ronald Schnabel, Managing Director of VDE VDI GMM and organizer of COSIMA, states: "The practical relevance of this competition is extremely important to us. That this pays off is shown, among other things, by the fact that startups have already emerged from COSIMA, such as

Heat-it from Karlsruhe, now a company with over fifteen employees." For COSIMA 2017, the team "Heat-it" developed an insect bite healer that can be heated up via smartphone.

### **About the VDE/VDI-Society Microelectronics, Microsystems and Precision Engineering (VDE VDI GMM)**

The VDE/VDI-Society Microelectronics, Microsystems and Precision Engineering (VDE VDI GMM) with its more than 7,500 members is currently divided into 6 specialist areas and about 35 specialized committees. They support the organization in conferences and workshops and do specialized work in the technical committees. In addition, they provide contacts to other technical societies within and outside the VDE and VDI.

For more information, visit [www.vde.com/gmm](http://www.vde.com/gmm)

### **About VDE**

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Our passion is the advancement of technology, the next generation of engineers and technologists, and lifelong learning and career development "on the job". Within the VDE network more than 2,000 employees at over 60 locations worldwide, more than 100,000 honorary experts, and around 1,500 companies are dedicated to ensuring a future worth living: networked, digital, electrical. Shaping the e-dialistic future.

The VDE (VDE Association for Electrical, Electronic & Information Technologies) is headquartered in Frankfurt am Main. For more information, visit [www.vde.com](http://www.vde.com)

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