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# Developers from all over the world rose to the ctrlX developR Challenge: These are the winners

Manuela Kessler | 03.08.2022 | Lohr am Main / Germany | PI 040/2022

Bosch Rexroth's competition results in innovative new automation solutions and encourages co-creation

- New technological approaches for automation
- Jury made up of managers from ePLAN, KUKA, SICK and Robert Bosch chose five winners
- The competition encouraged the sharing of ideas on an international level and co-creation



The five finalists of the ctrlX developR Challenge convinced the jury with innovative ideas. (Image source: Bosch Rexroth AG)

**Developing promising new solutions for automation from ideas – that was one of the goals of the ctrlX developR Challenge from Bosch Rexroth. Developers from all over the world rose to the challenge. Five finalists won over the jury on July 13. This was made up of managers from ePLAN, KUKA and SICK, together with Rolf Najork, Member of the Board of Management of Robert Bosch GmbH. The results exceeded everyone's expectations. Unexpected business potential with the ctrlX AUTOMATION solution and new perspectives for everyone involved were revealed.**

The ctrlX developR Challenge brought together the most talented developers with the open automation system from Bosch Rexroth. On the basis of ctrlX AUTOMATION and the control platform ctrlX CORE, the 25 participants selected from 68 entries put their ideas into practice. Working together with their mentors from Bosch Rexroth and ctrlX World partner companies, they broke new ground in the area of automation.

“It was really exciting to see what tasks beyond classic factory automation can be performed with ctrlX CORE. Thanks to the open control architecture, a range of new applications were possible. We'd not even thought about some of these ourselves. The participants gave us valuable food for thought regarding future business fields and challenged us when it comes to implementing modern technologies such as machine learning. The challenge provided some very interesting input for further developing ctrlX AUTOMATION,” said Jasmin Heim, Director Marketing, Business Unit Automation & Electrification Solutions at Bosch Rexroth.

### And the winners are...

At the two-day ctrlX developR Conference 2022 at Bosch Rexroth's TechPark in Ulm, the finalists presented their results during the pitch event. The jury assessed the pitches according to various main criteria: The idea and the approach, technical methods and implementation, added value,

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together with potential and the marketing concept and the final pitch presentation. The winners are:

- Andreas Schiffler (Germany): “Anomaly detection using Isolation Forest”
- Matthias Dittrich (Germany): “IoT solution for wireless sensor systems based on MQTT”
- Phillip Stanley-Marbell (Great Britain): “Estimating uncertainty in empirical sensor data for faster and more reliable AI applications.”
- Cesare Bornaghi (Italy): “Connecting industrial cameras with ctrlX AUTOMATION and adding AI algorithms”
- The special prize for students went to Sabari Kannan Muthalagu (Germany): “Automation system for controlling smoke extraction for soldering stations in laboratories”

### From machine learning and IoT to AI

With his project, Andreas Schiffler created a use case which, in the eyes of the jury, offers great market potential. “Anomaly detection using Isolation Forest on ctrlX CORE is used to automatically monitor a series process, e.g. pressing in a rubber part, with no need for prior knowledge,” said Andreas Schiffler. This machine learning process can also be adapted to suit other use cases.

Matthias Dittrich too won over the jury with his idea and how he carried out his project. On the basis of ctrlX AUTOMATION, he came up with a key development for the foundry industry and other sectors. The use case presented focused on an IoT solution for wireless sensors connectivity. This results in benefits when it comes to process analysis and optimization.

With his project, Phillip Stanley-Marbell ventured into the world of artificial intelligence. “People are making more and more decisions with the help of AI. But how can we trust the algorithms or machines when we are unsure ourselves?” he said, asking the central question. Phillip Stanley-Marbell therefore added new functions to ctrlX AUTOMATION, allowing it to be used to track down uncertainties in data in order to make sound, data-based decisions.

Cesare Bornaghi has made it possible to connect any industrial camera to ctrlX CORE and to add AI algorithms using standards such as ONNX for image analysis. The product which is known as CAM-ALL-IA will serve as a standard for the embedded integration of image processing systems into the ctrlX World ecosystem. The jury was particularly impressed by the advanced stage of development and the marketing concept which is already highly sophisticated.

Jasmin Heim summed up: “The competition showed that ctrlX AUTOMATION offers countless possibilities and is easy to use. It has also led to discussions between those involved. All participants and mentors are now part of our community. Some of them have already got together to discuss important topics in more detail. This is exactly what supports our co-creation approach: The best solutions come about as part of group work – ideally during regular ctrlX developR Challenges which will hopefully take place in the future.” We’re therefore planning to hold further competitions in the various regions.”

### Basic Information Bosch Rexroth

As one of the world’s leading suppliers of drive and control technologies, Bosch Rexroth ensures efficient, powerful and safe movement in machines and systems of any size. The company bundles global application experience in the market segments of Mobile Applications, Machinery Applications and Engineering, and Factory Automation. With its intelligent components, customized system solutions and services, Bosch Rexroth is creating the necessary environment

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for fully connected applications. Bosch Rexroth offers its customers hydraulics, electric drive and control technology, gear technology and linear motion and assembly technology, including software and interfaces to the Internet of Things. With locations in over 80 countries, more than 31,000 associates generated sales revenue of around 6.2 billion euros in 2021.

### Basic Information Bosch

The Bosch Group is a leading global supplier of technology and services. It employs roughly 402,600 associates worldwide (as of December 31, 2021). The company generated sales of 78.7 billion euros in 2021. Its operations are divided into four business sectors: Mobility Solutions, Industrial Technology, Consumer Goods, and Energy and Building Technology. As a leading IoT provider, Bosch offers innovative solutions for smart homes, Industry 4.0, and connected mobility. Bosch is pursuing a vision of mobility that is sustainable, safe, and exciting. It uses its expertise in sensor technology, software, and services, as well as its own IoT cloud, to offer its customers connected, cross-domain solutions from a single source. The Bosch Group's strategic objective is to facilitate connected living with products and solutions that either contain artificial intelligence (AI) or have been developed or manufactured with its help. Bosch improves quality of life worldwide with products and services that are innovative and spark enthusiasm. In short, Bosch creates technology that is "Invented for life." The Bosch Group comprises Robert Bosch GmbH and its roughly 440 subsidiary and regional companies in some 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. With its more than 400 locations worldwide, the Bosch Group has been carbon neutral since the first quarter of 2020. The basis for the company's future growth is its innovative strength. At 128 locations across the globe, Bosch employs some 76,100 associates in research and development, of which more than 38,000 are software engineers.

### Press Contact

Please get in touch with our Press Contact



**Manuela Kessler**

Spokesperson  
technology topics  
+49 9352 184145

[Manuela.Kessler@boschrexroth.de](mailto:Manuela.Kessler@boschrexroth.de)