

2026 Klee Prize: AI Makes Monitoring of Premature Babies More Human

First place in the 2026 Klee Prize goes to a young scientist for his work on a research project that could enable the monitoring of premature infants without sensors on the skin. Additional prizes go to contributions that break new ground in exoskeleton control and ECG data processing.

(Frankfurt am Main, June 24, 2026) Once a year, the Familie Klee Foundation, in collaboration with the German Society for Biomedical Engineering within VDE (VDE DGBMT), awards the Klee Prize to young scientists. In 2026, three projects were honored for highlighting highly innovative methods for future applications in medical technology. The focus is on AI-supported monitoring of premature infants, novel sensors for controlling exoskeletons, and the flexible design of chips for ECG signal processing. The awards will be presented [at the BMT on October 6, 2026, in Augsburg](#) (in German).

A Good Start in Life: Contactless Monitoring of Premature Infants Thanks to AI

The first prize, worth 6,000 EUR, goes to Dr.-Ing. Simon Lyra from RWTH Aachen University for his dissertation titled "Camera-Based Vital Signs Monitoring of Neonates in Real-Time using Deep Learning." Reliable monitoring of vital signs is essential to ensure a healthy start in life for premature infants. Until now, sensors have been attached to their sensitive skin, which can lead to injuries and infections.

Instead, Simon Lyra uses modern camera technology and AI-supported, automated recording and analysis of bodily functions such as heart rate, respiration, temperature, and movement. "Using image data from clinical studies and a model for newborns, we have demonstrated that this non-contact method works and enables gentler monitoring of vital signs," says Lyra. To

apply this approach in clinical practice at the Institute for Biomedical Engineering, further steps and studies are necessary, such as the parallel use of sensors and image-based analysis.

Following his dissertation, Lyra founded a startup with colleagues that develops automation solutions for skilled trades businesses. “After years in research, I’m now moving on to the business world for the time being.”

Assistance in a Nutshell: Novel Sensors for Exoskeleton Control

Second prize and 4,000 EUR go to Dr.-Ing. Bastian Latsch from the Technical University of Darmstadt for his doctoral thesis on “Flexible 3D-printed sensors for wearable motion analysis and assistive devices.” In his work, he explored how new transducer technologies can help improve the control of assistive systems such as prostheses or exoskeletons. He uses piezoelectric pressure sensors as a basis, which can be manufactured using 3D printing and are therefore very easy to adapt to individual requirements—one of the core topics in modern orthopedic technology.

“To date, movement intent has been captured in many applications using EMG sensors, which measure muscle activity electrically,” explains Latsch. “Our model works mechanically, and the sensors we use can detect both heavy loads and the slightest movements and deflections.” The young researcher developed and tested sensor-integrated insoles as well as so-called FMG (Force Myography) sensors that can be applied to the skin. In both cases, it was found that gait events and movement intentions were sometimes detected earlier than with the standard reference sensors used in each case.

“It was very exciting for me to work together with sports scientists, mechanical engineers, medical professionals, and psychologists on a solution,” says Latsch. “Now I will definitely stay in academia and see what new areas of focus emerge.”

Logic in the Smallest of Spaces: New Chip Design Consolidates Data Processing for ECG

Dr.-Ing. Ingo Hoyer from the Fraunhofer Institute for Microelectronic Circuits and Systems IMS in Duisburg is awarded third prize and 2,000 EUR for his dissertation “Reconfigurability in AI Hardware Accelerators for Energy-Efficient Biosignal Analysis.” While chip production is usually only profitable at volumes of several hundred thousand units, the demand for medical technology applications is typically around 1,000 or 5,000 units. Hoyer investigated how a new chip design could enable cost-effective manufacturing.

“We first combined the evaluation of biosignals with AI-based analysis capable of detecting conditions such as atrial fibrillation, heart disease, and epilepsy,” explains Hoyer. “Instead of the usual memory-based methods, we also use logic cells.” This allows for the development of a very compact chip that consumes little energy and reliably detects anomalies in the signal over

a period of several weeks. "Since we can implement similar algorithms on the same circuit, such a chip is suitable for various clinical conditions and can be reconfigured with minimal effort."

According to Hoyer, work on this research project came about through a series of fortunate coincidences, with the starting point being the VDE Talent Competition "Invent a Chip." "It was also through the VDE that I came into contact with Prof. Karsten Seidl, who offered me the opportunity to combine the analysis of biosignals with embedded design." Hoyer will continue to focus on circuit development in the future, as he will remain at Fraunhofer IMS.

About the German Society for Biomedical Engineering within VDE (VDE DGBMT):

The German Society for Biomedical Engineering within VDE (VDE DGBMT) is the scientific and technical society for medical technology in Germany. It was founded in Frankfurt am Main in 1961.

The VDE DGBMT brings together experts from all areas of technology applications in medicine and deals with the entire range of topics in biomedical technology. It organizes conferences and workshops for expert audiences and is the sponsor of two international scientific journals: Biomedical Engineering and Current Directions in Biomedical Engineering published by De Gruyter Brill. Position papers, statements and expert contributions discuss current topics independently and neutrally. In addition, the DGBMT awards promotional prizes for young scientists, for scientific excellence and innovation, and for patient safety in biomedical engineering. Last but not least, it represents German biomedical engineering in international bodies.

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