

11.01.2021 – 14:00 Uhr

CES 2021: Bosch puts its faith in AI and connectivity - for the protection of people and the environment



Stuttgart, Germany / Detroit, USA (ots) -

Intelligent, climate-friendly solutions for health, living, industry, and mobility

- Bosch board of management member Michael Bolle: "Bosch combines AI and connectivity to form the AIoT so it can improve energy efficiency and fight the coronavirus."
- Intelligent health and safety: Bosch AIoT solutions honored with
- CES® Innovation Award Honorees.
- More advanced software: Bosch's rapid coronavirus test can now detect positive samples in less than 30 minutes.
- Sustainable #LikeABosch: latest installment of image campaign shows how everyone can do their part to contribute to climate protection.
- Climate action is paying off: Carbon Disclosure Project adds Bosch to its A List.
- AI in space: Bosch expertise to help navigate mini robots on lunar surface.

To improve people's health and to protect our planet, Bosch is counting on AIoT, taking advantage of the possibilities offered by data, artificial intelligence, and the internet of things to benefit people and the environment with technical solutions. "We combine AI and connectivity to form the AIoT, which helps us improve energy efficiency and fight the coronavirus," says Michael Bolle, Bosch board of management member. "AIoT offers enormous potential. We are already unlocking this potential and plan to expand our efforts in the future." Under the tagline "Sustainable #LikeABosch," the company will be presenting intelligent, sustainable solutions for health, living, and mobility at the virtual tech trade fair CES 2021.

Among the innovations Bosch is debuting at the tech show is the world's first self-learning AI sensor for wearables and hearables in fitness tracking. Since the AI runs on the sensor itself (edge AI), there's no longer any need for an internet connection during an exercise session - this improves energy efficiency and data privacy. The company is also presenting a sensor that measures factors such as air quality and relative humidity. This delivers information about the concentration of aerosols in the air - data that has become especially important in the fight against the coronavirus. Bosch security cameras can also help in the fight against the virus. AI makes it possible for them to execute a wide array of customer-specific applications. For example, a new camera solution with integrated intelligent video analysis measures body temperature contactlessly, anonymously, and with high precision - with a maximum deviation of half a degree. Moreover, using a software solution for the open camera platform of the Bosch startup Security and Safety Things, these cameras can detect whether the number of people in a shop complies with the prevailing coronavirus restrictions. This platform was designated a 2021 CES® Innovation Award Honoree, making it one of four Bosch solutions singled out this year. Another premiere is a portable hemoglobin monitor that can detect anemia by means of a finger scan. The device is particularly well suited for regions that have insufficient access to medical care. Equipped with AI, the hemoglobin monitor delivers a result within 30 seconds - no lab test or blood draw necessary.

At the moment, the best example of how innovative Bosch technology can improve health and well-being is the coronavirus PCR test on the Bosch Vivalytic testing device. This now delivers results even more quickly: laboratories, doctors' offices, nursing homes, and hospitals can evaluate five samples simultaneously in 39 minutes - technology literally "invented for life." Thanks to improved software, positive samples can be detected even in under 30 minutes. The development of the Vivalytic system, which

consists of an analysis device and test cartridges, grew out of a long-standing collaboration between Bosch's corporate research and advance engineering, Bosch Healthcare Solutions, and the Robert Bosch Hospital.

Sustainable #LikeABosch: Bosch as a pioneer in climate action

A study recently published in Germany indicated that AIoT can go beyond health applications to support climate action as well. The study found that comprehensive digitalization in mobility, manufacturing, and building technology could help get the country nearly halfway to achieving the Paris Agreement emissions targets (source: [Accenture](#)).

Here is where Bosch takes a hand: its tagline for this year's CES - "Sustainable #LikeABosch" - expresses one aspect of the company's entrepreneurial responsibility. The [sequel of the #LikeABosch image campaign](#) highlights how everyone can do their part to protect the environment with sustainable products. Bosch itself is leading by example: according to in-house calculations, all the company's 400 locations worldwide have been carbon neutral since 2020. Bosch is the first globally operating industrial enterprise to achieve net zero carbon emissions with respect to the energy it produces and the energy it sources externally. "The next step for Bosch is to address emissions along the entire value chain, from procurement to product use," Bolle says. In that vein, Bosch is the first automotive supplier to join the Science Based Targets initiative with a specific and ambitious goal: by 2030, to cut upstream and downstream CO2 emissions by 15 percent. Bosch's achievements in climate action have won recognition outside the company as well: the non-profit Carbon Disclosure Project (CDP) has added Bosch to its A List.

Through its advisory company Bosch Climate Solutions, founded last year, Bosch shares its experience as a climate action pioneer with other companies. The Bosch startup markets several solutions, including the Bosch cloud-based energy platform, which applies intelligent algorithms to reduce the energy consumption of machines and thus increase the efficiency of production processes. Bosch has already deployed the platform at more than 100 locations, making a major contribution to improving energy efficiency - the main lever in the company's efforts to go carbon neutral.

Digital and sustainable is the way forward: into the pole position with industrial AI

As this example shows, digitalization is paving the way for sustainability. "We want to be the leading AIoT company in every area that we operate in," Bolle explains. Trust in AI is the most important prerequisite for it to become established, so that it can improve the lives of people and help limit climate change. To this end, Bosch relies on industrial AI, which explains the physical world to machines - instead of teaching them how to behave like people. Nonetheless, this requires ethical guidelines. To set them, Bosch has drawn up an AI code of ethics that centers on the idea that humans always retain control.

In addition to improving energy efficiency in manufacturing, Bosch is systematically adding connectivity to its products for buildings and mobility to help consumers save energy. One of these products is an energy manager that the company offers for use in private homes. When combined with a heat pump and photovoltaic system, the manager can cut energy consumption by up to 60 percent. In the mobility sphere, drivers of electric vehicles can benefit from services such as Battery in the Cloud, which uses smart software analysis to reduce battery wear by up to 20 percent.

In general, the combination of electrified and automated driving with personalized and connected services will open up a broad field for software applications. Vehicle computers are central to Bosch's efforts to extend its leading role in software-intensive electronic systems. To meet this demand, the new Cross-Domain Computing Systems division and its 17,000 associates started operations at the beginning of the year. In this unit, Bosch is combining its capabilities in hardware and software engineering for vehicle computers, sensors, and control units for all vehicle domains. This reduces complexity in vehicle development and will get new functions on the road significantly faster.

Expertise to help explore the moon: aiming high with Bosch AI

From earthbound roads to activities in space: whereas last year's CES saw the premiere of the SoundSee AI sensor system for the International Space Station, this time Bosch has set its sights on the moon. As part of NASA's Tipping Point program, Bosch is joining forces with the companies Astrobotic and WiBotic as well as the University of Washington to research and develop technology to intelligently navigate and wirelessly charge small robots for operation on the moon. Bosch researchers working on the project in Pittsburgh and Silicon Valley are contributing their expertise in AI-based intelligent data analysis and wireless connectivity solutions. The resulting findings will flow into the further development of Bosch AIoT solutions back on earth.

All this clearly shows how much potential AIoT offers, as well as the key role sustainability plays in it. "Only companies that pursue sustainability today and unlock the enormous potential of AIoT, will be successful tomorrow," Bolle says.

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