

Press release



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Sensors get clever: AI revolutionizes fitness tracking

Self-learning AI sensor enables personalized solutions for every user in wearable and hearable devices

- World's first self-learning AI sensor for wearables and hearables
- Unique self-learning and personalization features enable users to easily train devices with customized fitness activities
- All-in-one solution reduces development time, cost and complexity and most importantly: power consumption with automatic tracking
- Edge AI requires no cloud connectivity: reducing latency, improving privacy

Squats, crunches or kettlebell swings: The list of fitness exercises available nowadays is almost endless. Many fitness trackers or smartwatches, however, offer only a very limited number of activities that can be tracked and do not recognize activities reliably due to different performance styles, equipment, heights and energy levels of users. To solve such problems, Bosch Sensortec has developed a revolutionary self-learning motion sensor that adds artificial intelligence (AI) to portable devices: the BHI260AP self-learning AI sensor.

The sensor enables manufacturers of wearable and hearable devices to provide highly personalized fitness tracking through self-learning AI software in the sensor. It recognizes and adapts to a wide variety of movements and is able to learn any new fitness activity that is based on repetitive, cyclical patterns. Users can hence be trainers and trainees at the same time.

"The self-learning AI sensor will change how users interact with their fitness devices from a mere one-way approach to an interactive way of training", says Dr. Stefan Finkbeiner, CEO at Bosch Sensortec. "This new sensor combines Bosch Sensortec's long-term experience in smart motion sensors with its strong competence in innovative software development."

One piece of software - four features

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The self-learning AI software is available with a standard set of more than fifteen pre-learned fitness activities, so no training is required before use. In addition, it offers four product features: learn, personalize, auto track and enhance. The learning mode offers users the option to add new fitness activities that were originally not supported, enabling them to customize the device to their individual needs. The personalization feature enables users to adapt existing, pre-learned activities to their own individual style, increasing the accuracy of calorie counting and activity analyses.

With the auto track function, users can automatically track fitness activities without any manual intervention and analyze their intensity with activity type and count over time – enabling both endurance and strength training. Finally, manufacturers can add new fitness activities without having to modify the software or needing an original dataset. These new transferable exercises may be provided by coaches or star athletes, enabling benchmarking against the best and learning from experts, or simply from the users' friends. This enhances the perceived value of devices and strongly helps the manufacturers to differentiate.

With the AI running on the sensor itself, hence on the edge, no connectivity to the cloud or even a smartphone is needed. This keeps the data private and means activities can be continuously tracked and analyzed, without the need for an internet connection or tethering to a phone. Edge AI also minimizes latency and power consumption, meaning users can get fast, real-time feedback and extended charging intervals on their devices.

All-in-one solution with multiple software options

The new sensor is provided to manufacturers as an integrated System in Package (SiP) solution, which includes the hardware, software and embedded AI. This reduces development time and costs, and cuts time to market.

In addition to the self-learning AI software, Bosch Sensortec offers a wide range of software solutions for the BHI260AP. Wearables manufacturers can simply load the required software on to the sensor to enable solutions targeted at specific use cases including orientation tracking, position tracking (PDR) and swimming. The sensor recognizes four different swimming styles: butterfly, backstroke, breaststroke and freestyle. Since the BHI260AP is a fully programmable sensor, manufacturers can build their own customized software to be embedded in the BHI260AP or upload customized solutions depending on the users' context. To protect these customized solutions from unauthorized use, the smart programmable sensor offers a digital signature.

To make development of AI based wearable solutions even easier, Bosch Sensortec offers an application board along with a BHI260AP shuttle board, which can be wirelessly connected over Bluetooth Low Energy (BLE) to smartphones.

Availability

The BHI260AP self-learning AI sensor and the corresponding shuttle board are

available via Bosch Sensortec's distributors. The different software packages are available for download at the Bosch Sensortec website.

Website:

[More information about the product](#)

Video:

[Discover how the self-learning AI sensor personalizes fitness tracking](#)

White paper:

[Find out more about the swimming software in the article "Swim like a fish with AI"](#)

[Find out more about the fitness tracking in the article "Me, myself and AI"](#)

Bosch at CES 2021:

- **VIRTUAL PRESS CONFERENCE: Monday, January 11, 2021**, from 8:00 to 8:30 EST (14:00–14:30 CET) with Dr. Michael Bolle, Bosch CTO, CDO, and management board member, and Mike Mansuetti, president of Bosch North America, at the [Bosch Media Service](#).
- **VIRTUAL BOOTH: January 12 - February 15, 2021**, at www.ces.tech
- **FOLLOW** the Bosch CES 2021 highlights on Twitter: [#BoschCES](#)
- **DEEP-DIVE SESSIONS WITH BOSCH-EXPERTS: January 12 - February 15, 2021**, at www.ces.tech
 - *Sustainable #LikeABosch: How a key global industry player drives carbon neutrality at its sites* with **Torsten Kallweit**, Head of Corporate Office Health, Safety, Environmental and Fire Protection as well as Sustainability and Manager CTO Bosch Climate Solutions GmbH, and **Annette Wagner**, Head of Sustainability and Ideas Lab
 - *Move #LikeABosch: Technology for sustainable future mobility* with **Mike Mansuetti**, President of Bosch North America, and **Tim Frasier**, Regional President Automotive Electronics North America
 - *Artificial intelligence in use: Application examples from the fields of fitness tracking and well-being to smart cameras* with **Kaustubh Gandhi**, Senior Product Manager, and **Sina Isabell Springer**, Business Development Manager
 - *Perfectly keyless advanced* with **Tim Frasier**, Regional President Automotive Electronics North America, **Daniel Kornek**, Head of Product Area Vehicle Access (Perfectly Keyless), and **Jia Hou**, Business Development Manager

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Basic information:

Bosch Sensortec GmbH, a fully owned subsidiary of Robert Bosch GmbH, develops and markets a wide portfolio of microelectromechanical systems (MEMS) sensors and solutions tailored for smartphones, tablets, wearables and hearables, AR/VR devices, drones, robots, smart home and IoT (Internet of Things) applications. The product portfolio includes 3-axis accelerometers, gyroscopes and magnetometers, integrated 6- and 9-axis sensors, smart sensors, barometric pressure sensors, humidity sensors, gas sensors, optical microsystems and comprehensive software. Since its foundation in 2005, Bosch Sensortec has emerged as the MEMS technology leader in the markets it addresses. Bosch has been both a pioneer and a global market leader in the MEMS sensor segment since 1995 and has, to date, sold more than 10 billion MEMS sensors.

For more information, please visit www.bosch-sensortec.com, twitter.com/boschMEMS, community.bosch-sensortec.com, <https://www.linkedin.com/company/bosch-sensortec/>

The Bosch Group is a leading global supplier of technology and services. It employs roughly 400,000 associates worldwide (as of December 31, 2019). The company generated sales of 77.7 billion euros in 2019. 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 60 countries. Including sales and service partners, Bosch's global manufacturing, engineering, and sales network covers nearly every country in the world. The basis for the company's future growth is its innovative strength. Bosch employs some 72,600 associates in research and development at 126 locations across the globe, as well as roughly 30,000 software engineers.

Additional information is available online at www.bosch.com, www.iot.bosch.com, www.bosch-press.com, www.twitter.com/BoschPresse