

Press release  
4 November 2019

## **Cutting-edge research into AI and robotics: BMW Group Research makes debut at IROS 2019.**

**+++ The BMW Group is showcasing its expertise in the fields of artificial intelligence and robotics for the first time at the international conference in China. +++**

**Munich/Macau.** BMW Group Research will be making its debut appearance at the prestigious IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS) this year. It will be staging a total of three workshops on artificial intelligence (AI) and robotics at the event in Macau, having secured its place at the world's leading robotics conference with the submission of groundbreaking content for the initial peer-review process. As well as reinforcing the BMW Group's knowledge base and ability to actively influence scientific debate both now and in the future, this also represents confirmation of the considerable expertise the company has amassed in industrial applications for AI and robotics as part of the international academic community.

The BMW Group already makes judicious use of AI throughout the value chain. The three workshops it will be running at IROS 2019 – devised in collaboration with partners including the Technical University of Munich – focus on research into groundbreaking applications for AI and robotics. A keynote speech from Michael Würtenberger, Head of the BMW Group's "Project AI" Excellence Cluster, will kick off the workshops. "AI is already being applied pragmatically in many different areas of the company where it can help us to reduce complexity, increase efficiency and generate added value for our customers," says Würtenberger. "At BMW Group Research, we are in a position where we can explore the future possibilities of AI, enabling us to address these areas at an early stage in our development activities."

### **Focusing on the future of human-machine interaction.**

The research workshops will centre around the development of future forms of artificial intelligence based on biological models, materials and technologies in robotics and interaction between humans and intelligent vehicles. Below is a summary of the

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workshops' content.

### **Intelligent vehicles get in touch with emotions.**

In the future, vehicles may be able to actively cater to their occupants' requirements far more effectively than today with the help of AI. Proactive abilities and personalisation will be of crucial importance for comfort- and safety-related areas in autonomous vehicles. The key here will be the ability to correctly interpret intentions and the current emotional state of vehicle users. The purpose of this workshop is to demonstrate and discuss how human behaviour and emotionality can be registered and processed using a multimodal system of sensors in order to then investigate and develop AI-based functions.

"This workshop brings together international leading experts to discuss future challenges and possible solutions for intelligent vehicles," says Alois Knoll, Professor of Robotics, Artificial Intelligence and Real-time Systems at the Technical University of Munich. "Interpreting human behaviour intelligently is a vital building block in creating seamless, safe and reliable interaction between humans and autonomous machines, and pivotal in growing their users' trust in this new technology."

### **Tactile perception: how robots process touch.**

The development of an artificial sense of touch offers enormous potential for robotics. Enabling machines to replicate the human sense of touch requires the complex interplay of myriad components, ranging from sensors to intelligent perception algorithms. This ability will be essential if humans and machines are to interact and collaborate with one another in a natural and safe way. This workshop focuses on the development of the necessary sensor technology and its integration into existing robotic systems. Potential applications for this technology at the BMW Group include new forms of interaction in vehicle interiors.

"The human sense of touch employs an extraordinarily complex and dense network of receptors," says Oliver Brock, Professor of Robotics at the Technical University of Berlin. "The quest to replicate them brings huge technical challenges but also incredible

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opportunities to make human-machine interaction far more intuitive. Machines will learn to ‘grasp’ their surroundings in the most literal sense of the word.”

### **Real-time machine perception.**

To allow safe, comfortable interaction between humans and machines, an intelligent system must be capable of understanding its environment in real time and taking decisions based on the resulting data. As Gregor Schöner, Professor of Autonomous Robotics at Ruhr University Bochum, explains: “Bio-inspired neural networks provide the crucial basic ability needed for this, but still often come up against barriers when used for safety-critical functions.” Experts will lead discussions on the resulting clash of objectives during the workshop.

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### **The BMW Group**

With its four brands BMW, MINI, Rolls-Royce and BMW Motorrad, the BMW Group is the world's leading premium manufacturer of automobiles and motorcycles and also provides premium financial and mobility services. The BMW Group production network comprises 31 production and assembly facilities in 15 countries; the company has a global sales network in more than 140 countries.

In 2018, the BMW Group sold over 2,490,000 passenger vehicles and more than 165,000 motorcycles worldwide. The profit before tax in the financial year 2018 was € 9.815 billion on revenues amounting to € 97.480 billion. As of 31 December 2018, the BMW Group had a workforce of 134,682 employees.

The success of the BMW Group has always been based on long-term thinking and responsible action. The company has therefore established ecological and social sustainability throughout the value chain, comprehensive product responsibility and a clear commitment to conserving resources as an integral part of its strategy.



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