

# PRESS RELEASE

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## Trustworthy embedded AI with RISC-V

**The Fraunhofer Institute for Microelectronic Circuits and Systems IMS has developed a trustworthy embedded AI (Artificial Intelligence) on an RISC-V basis. With this development the research institute from Duisburg is expanding its offerings for Trusted Electronics.**

Researchers at Fraunhofer IMS have succeeded in the development of an efficient microcontroller core on the basis of a free RISC-V command set architecture as well as its extension of hardware acceleration for AI applications. “In combination with the AlfES framework for embedded AI we have enabled a system for the application of artificial intelligence on sensor- and actuator-related embedded systems”, explains Alexander Stanitzki of Fraunhofer IMS.

### Reliable data encryption

For the protection of the AI algorithms and learning data from IP theft, the chips can be equipped with a hardware firmware encryption. The chips protect their memory content via the built-in encryption against external access and also offer hardware acceleration for the most popular encryption methods for the communication.

With this development Fraunhofer IMS is extending its offerings for trustworthy hardware (Trusted Electronics) with the field of embedded AI and relies specifically on open hardware standards like RISC-V. Softcores for various FPGA platforms and optimized software libraries are available for the evaluation. Chips are available as of spring 2020 and the integration into customer-specific ASIC developments is now possible. This also includes the possibility to expand the RISC-V core with customer-specific modules.

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**Redaktion**

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**FRAUNHOFER-INSTITUTE FOR MICROELECTRONIC CIRCUITS AND SYSTEMS IMS**

**Fraunhofer IMS**

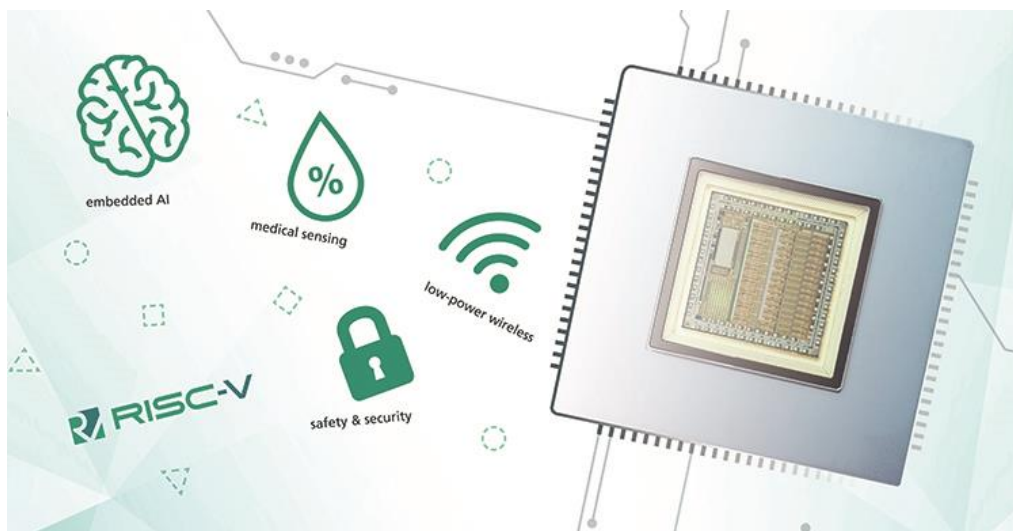
For over 30 years scientists at Fraunhofer IMS in Duisburg have been working on the development of microelectronic circuits, electronic systems, microsystems and sensors. Because of its comprehensive know-how, the access to technology and the high-quality development work the Institute is a worldwide recognized partner for the industry. In eight business units Fraunhofer IMS is dedicated to applied research, advance development for products and their applications. Stable, efficient and marketable technologies and procedures that are used in extremely many branches take center stage in contract work.

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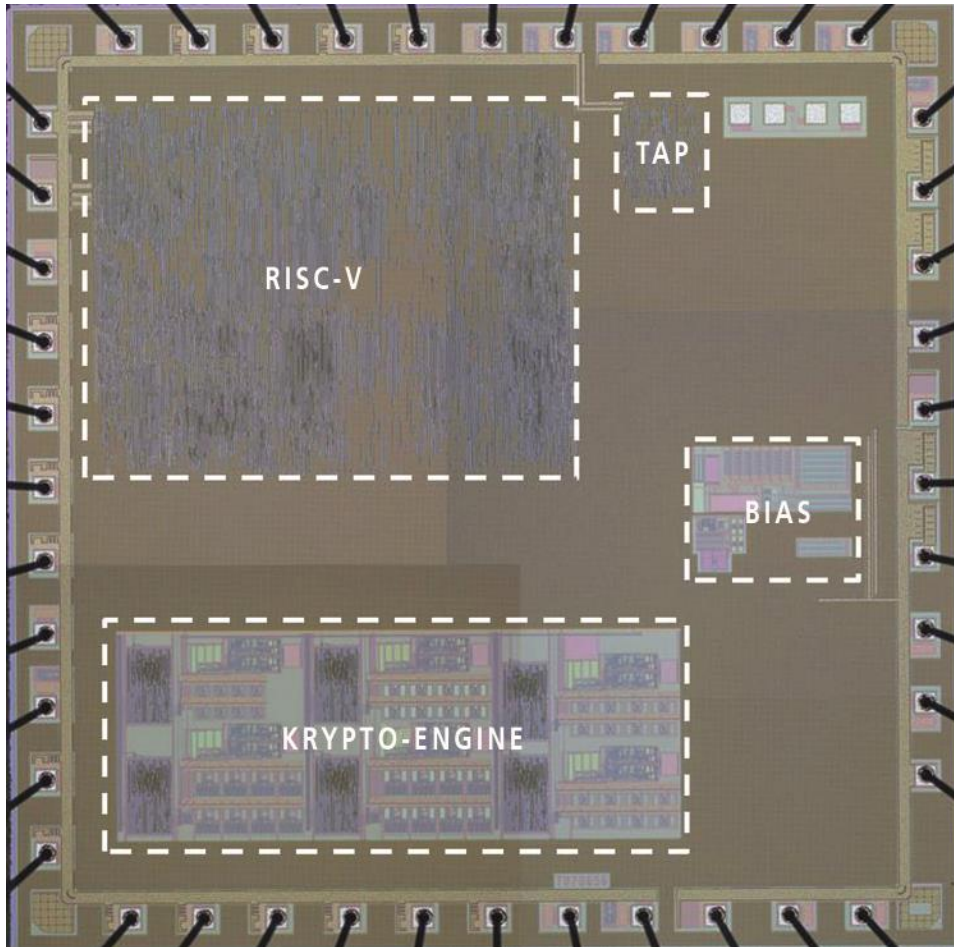
**Pictures and captions**



On the basis of the free RISC-V command set architecture, scientists at the Fraunhofer IMS have succeeded in creating an efficient microcontroller core that enables the combination of different elements on a single chip.

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Chip with the efficient microcontroller core developed by Fraunhofer IMS based on the RISC-V command set architecture (top left) and the JTAG TAP (Test Access Port, top right).

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