



PRESSE-INFORMATION
PRESS RELEASE

Page 1/5, April 19, 2021

One Board, All Platforms: ZF Drives Vehicle Intelligence with ProAI Supercomputer

- **New ZF ProAI advances the most flexible, scalable and powerful automotive-grade supercomputer on the market**
- **AI-capable high-performance computer suitable for all applications for automated driving Levels 2 to 5**
- **Several major orders with start of series production in 2024**
- **Cost-effective Automated Valet Parking solution to realize serial production in 2022 on a COEM model**

Shanghai (China). The intelligence of future vehicles will be controlled by a few extremely powerful central computers. They will run the computationally intensive software functions that control critical vehicle domains. These include automated driving, electric mobility, vehicle motion control and integrated safety. Thus, high-performance computers and intelligent software functions are the key enablers for the software-defined vehicles of the future and drive safe and smart mobility experience to contemporary consumers.

At Auto Shanghai 2021, ZF unveiled the next generation of its ZF ProAI. "It is currently the most flexible, scalable, and powerful automotive-grade supercomputer in the world," emphasized Dr. Holger Klein, ZF Board Member for the Asia-Pacific region, at Auto Shanghai. Designed for the requirements of software-defined vehicles and their new electric/electronic architectures, this artificial intelligence (AI) capable high-performance computer can serve as domain, zone or central controller. It is suitable for any vehicle type and for all levels of automated or autonomous driving: from Level 2 to Level 5. ZF ProAI will go into serial production latest in 2024.

"Several significant orders for our high-performance computing platform confirm our vanguard position to drive vehicle intelligence," said Dr. Holger Klein. "Offering high computing power, cutting-edge software solutions, intelligent sensors, and smart actuators from a single



PRESSE-INFORMATION
PRESS RELEASE

Page 2/5, April 19, 2021

source, ZF creates new possibilities for data-based business models for next generation mobility."

ZF ProAI – world's most powerful automotive supercomputer

Smaller, more economical but also more powerful than ever before: The ZF ProAI has been upgraded in many aspects. Apart from better computational performance with up to 66 percent more teraOPS, it simultaneously consumes up to 70 percent less power (3 teraOPS per Watt on average).

Its AI-capabilities are optimized for deep learning processes, further enhancing its ability to deliver advanced safety features: the board offers a 360° GPU-driven fusion of all available sensor data, including environmental measurement data from radars, LiDARs, cameras and audio patterns. Additionally, it also saves on necessary installation space.

Even considering the available cooling options – passive cooling, air cooling and liquid cooling depending on the desired performance –, most ZF ProAI models will come in the same 24x14x5 cm standard housing. As an automotive-grade product, its high-tech interior is resilient and reliable under harsh conditions, and it also offers the latest safeguards against cyber threats.

The supercomputer's modular set-up means it can be equipped with System-on-Chip (SoC) variants from different manufacturers to achieve the preferred customer solution. Likewise, it can operate ZF's own software or that of other developers or third-party suppliers. Standardized connectors and the option to link more ZF ProAI units together make it flexible for use and installation in any type of vehicle.

ZF's high-performance board offers the flexibility to achieve computing capability from 20 to 1,000 teraOPS. That is 1,000 trillion – or one quadrillion – computing operations per second. Adding the variety of available cooling options, OEMs now find a custom-fitted solution for all their vehicle platforms, software applications and E/E architectures –



PRESSE-INFORMATION
PRESS RELEASE

Page 3/5, April 19, 2021

through a single type of control unit. This increases efficiency and reduces costs.

ZF also provides a measurement data interface (MDI) for ProAI to forward the collected sensor data unaltered to a central storage system for development and testing purposes. This makes it much easier for developers to train artificial intelligence for autonomous driving.

Cost-effective Automated Valet Parking solution

ZF is currently developing the first valet parking system globally that enables driverless parking relying only on the vehicle's sensor set and being independent of a pre-mapped parking garage infrastructure. At Auto Shanghai 2021, ZF demonstrated Visual Simultaneous Localization and Mapping (vSLAM) technology to the public that enables Centimeter-accurate localization and real-time map generation. The sensor set is mainly based on one front camera, one front radar, four surrounding cameras and twelve ultrasonics but scalable with more advanced sensors as well as connectivity.

"The entire system is developed in China and will have its debut at a Chinese car manufacturer at the end of 2022," said Ms. Renee Wang, President of ZF China and Senior Vice President Operations for the Asia-Pacific region. "We believe that this infrastructure-independent automated valet parking system from ZF will be a cost-effective solution for many global OEMs."

Leading Commercial Vehicle Assistance Systems

As a leader in commercial vehicle technologies, ZF will demonstrate its broad range of intelligent, efficient and automated driving solutions. ZF's most advanced emergency braking system for commercial vehicles, OnGuardMAX, has its global launch at Auto Shanghai and its debut on Chinese roads. The technology can identify and – if necessary – react precisely to a broad range of moving and stationary objects, including vehicles and pedestrians. OnGuardMAX can support the driver reliably in a variety of dangerous driving situations while helping to effectively reduce the risk of accidents.



PRESSE-INFORMATION
PRESS RELEASE

Page 4/5, April 19, 2021

Answering the increasing demand for improved vehicle efficiency and reduced CO₂ emission to support global sustainability, ZF introduces OptiPace, a Predictive Economical Cruise Control system (PECC) that can anticipate and adapt the vehicle's most economic speed based on the road topography ahead to help minimize fuel consumption, brake pad wear and emissions.

The Autonomous Driving Open Platform Technology (ADOPT) offers an efficient and flexible industry model for the development of autonomous driving applications for commercial vehicles. It translates instructions from the autonomous driving artificial intelligence into real vehicle motion commands by enabling the control of all relevant vehicle actuation systems.

Captions:

- 1) Dr. Holger Klein, ZF Board Member, and Renee Wang, ZF China President and SVP Operations in Asia Pacific, present the new ZF ProAI supercomputer at Auto Shanghai 2021.
- 2) With the new ZF ProAI, ZF presents the automotive industry's most flexible, scalable, and powerful supercomputer. It is AI-capable and suitable for all applications from automated driving Level 2 to 5.
- 3) High-performance controllers, software solutions, intelligent sensors, smart actuators, integrated systems: ZF highlights its expertise as a comprehensive systems supplier for the automotive industry at Auto Shanghai 2021.
- 4) ZF is currently developing the first valet parking system globally that enables driverless parking relying only on the vehicle's sensor set and being independent of a pre-mapped parking garage infrastructure.
- 5) ZF advanced commercial vehicle systems enhance safety, reduce emissions, enable automated operation and the electrification of large vehicle powertrains.

Images: ZF



PRESSE-INFORMATION
PRESS RELEASE

Page 5/5, April 19, 2021

Press contacts:

Mirko Gutemann, Corporate External Communications,
Phone: +49 7541 77-960136, e-mail: mirko.gutemann@zf.com

Gu Ming, Head of Asia-Pacific Communications,
Phone: +86 21 3761 7046, e-mail: ming.gu@zf.com

Anthony Sapienza, Head of North America Communications,
Phone: +1 734 582 1646, e-mail: tony.sapienza@zf.com

About ZF

ZF is a global technology company supplying systems for passenger cars, commercial vehicles and industrial technology, enabling the next generation of mobility. ZF allows vehicles to see, think and act. In the four technology domains of Vehicle Motion Control, Integrated Safety, Automated Driving, and Electric Mobility, ZF offers comprehensive product and software solutions for established vehicle manufacturers and newly emerging transport and mobility service providers. ZF electrifies a wide range of vehicle types. With its products, the company contributes to reducing emissions, protecting the climate and enhancing safe mobility.

In fiscal year 2020 ZF reported sales of €32.6 billion. The company employs more than 150,000 associates at approximately 270 locations in 42 countries.

For further press information and photos, please visit: www.zf.com