

Focus topic Automotive

Digital engineering for software and systems in the automotive industry

fortiss is actively shaping the future of automotive software technology and making tomorrow's mobility safer, smarter and more efficient.

In an industry sector with frequent budget and resource constraints, fortiss plays a crucial role by providing state-of-the-art research and development capabilities that are often not feasible for companies to achieve on their own.

As an innovation hub for the automotive industry, fortiss offers efficient and well-founded solutions that are particularly suited to today's software development requirements.

Why fortiss should be your first choice:

- **The latest scientific findings:** Access to the latest research results in software technology.
- **Reliable engineering competence:** Expertise in the development of complex systems.
- **Agile project methods:** Flexible adaptation to market requirements and rapid project implementation.
- **State-of-the-art research:** Use of the latest technologies for innovative developments.
- **Specialized expertise:** Implementation of industrial prototypes and tailor-made solutions for the specific requirements of the automotive industry.
- **Long-term partnerships:** Development of sustainable solutions for a successful future.

Services

The fortiss services for the automotive industry can be found on the back page →

Through specialized research expertise and the use of state-of-the-art technologies and algorithms, fortiss promotes the integration of AI and machine learning to create innovative and sustainable solutions for the future of the automotive industry.

Use cases



Pioneering autonomous driving functions



Connected mobility services and intelligent transport infrastructure



Safe and user-friendly human-machine interaction



Digitalization and automation in automotive production

Detailed information on the use cases can be found in the inner section →

Contact us:

www.fortiss.org/en/automotive

info@fortiss.org

[in](#) [▶](#) [◻](#) [f](#) [X](#) [↻](#)

fortiss



Pioneering autonomous driving functions

The development of safe autonomous driving functions is powered by the integration of advanced algorithms and AI in the software.

By combining expertise from multiple research fields, we enable vehicles to achieve exceptional navigation, decision-making, and responsiveness in complex traffic situations.

This enhances not only the safety but also the efficiency and reliability of autonomous driving systems.

Competencies

- Design of robust architectures
- Variant management
- AI-based driver assistance systems
- Object recognition and environmental perception
- Decision-making and driving control
- Predictive maintenance
- Evidence-based safety assurance for autonomous systems



Connected mobility services and intelligent transport infrastructure

Intelligent networking through vehicle-to-everything (V2X) technology allowed us to enhance communication between vehicles, infrastructure, and mobility services.

This created numerous opportunities for us to significantly improve transportation infrastructure, optimize traffic flow, and introduce innovative services and applications.

By leveraging our comprehensive software skills, we effectively designed and integrated these complex communication systems.

Competencies

- Data exchange and use
- Digital twin
- Intermodal mobility
- Usage Control
- Fleet management and optimization



Safe and user-friendly human-machine interaction

The development of modern infotainment systems is a key challenge in the automotive industry.

Expertise in human-centered software development is essential to create user-friendly and efficient solutions.

Our goal is to design systems that are intuitive and easy to use, reducing drivers' distractions while enhancing comfort and safety.

Competencies

- Explainable and trustworthy AI
- Adaptive AI driver assistance systems
- Multimodal interaction through energy- and latency-efficient control
- Decision-making and driving support



Digitalization and automation in automotive production

The digitalization of production processes creates new opportunities for optimizing efficiency, quality and safety.

In the automotive industry, this enables the flexible and cost-efficient design of production facilities. At the same time, digitalization presents companies with challenges such as integrating new technologies, adapting existing systems and ensuring data security and integrity.

Competencies

- Model-based system development
- Automated data acquisition and processing
- Digital twin
- Flexible production planning
- Smart variant management
- Automated test generation
- Post-production testing through AI
- Predictive maintenance



Industry-related studies and potential analyses

fortiss provides scientifically prepared potential analyses and specialist studies in the fields of AI, Industry 4.0, autonomous driving and cognitive systems – specially tailored to the requirements of the automotive industry.

In company-specific workshops, we work out your individual challenges and requirements, analyse the problems, identify possible causes and solutions and develop optimization options to tap into the untapped potential of your organizations.

The results can be used as the basis for developing for the development of concrete prototypes or for the establishment of cooperation projects.



Industry contract research

fortiss is a reliable technological and manufacturer-independent partner for companies in the automotive industry that want to implement innovative digital processes, products or services in pilot projects. Depending on the scope of the project, the institute develops initial concepts through to pre-competitive software solutions (TR level 6), which are evaluated in industrial environments.

fortiss designs projects with industrial partners within the framework of public funding, whether in bilateral cooperations or larger consortia. In introductory workshops, we identify suitable cooperation and funding opportunities, support the submission of project proposals and offer first-class research in the field of software and AI.



Customized prototyping

fortiss takes on software engineering based on specific simulation environments and offers numerous opportunities for exploring, testing and evaluating new solutions for software-intensive systems. You benefit from the know-how of experienced experts who jointly develop solutions for challenges in the automotive environment.

Our offer includes prototyping workshops to develop ideas and test innovative methods, the uncomplicated initiation of proof-of-concept projects and rapid prototype developments. As well as the scientific evaluation of customized approaches and the development of a software prototype in a pilot project lasting several months.



fortiss Labs and test vehicles

The fortiss Labs offer companies spaces in which partners from research and industry can interact using existing or newly developed demonstrators. Platforms, simulation environments and software tools are available here.

The fortiss Mobility Lab enables the practical testing of technologies using realistic automotive use cases with fortiss open source solutions.

Technologies are tested under real-life conditions, while tests on cooperative driving are carried out with the "fortuna" research car and a small-scale vehicle.



Qualification programs for the automotive industry

fortiss offers customized training and further education courses for companies in the automotive industry. These include application-oriented training courses, workshops and lectures in which experts impart both theoretical knowledge and practical skills. This combination is crucial for the successful implementation of innovative software solutions.

Our training courses cover specific methods and tools, highlighting the potential of new software technologies and their application in the automotive sector. In addition, we offer customized training to provide teams with the necessary knowledge for specific challenges, including model-based systems engineering, machine learning, artificial intelligence and edge AI.

Your contact:

Dr. Holger Pfeifer

Scientific managing director

+49 89 3603522 29

pfeifer@fortiss.org



Further information on the focus topic Automotive can be found on our website.



www.fortiss.org/en/automotive

Contact us:

www.fortiss.org/en/automotive

info@fortiss.org

in