FZI Press Release

Autonomous Driving in the Smart City: FZI Presents AI-based Remote Assistance

On October 13, 2023, the FZI Research Center for Information Technology presented the support of autonomous driving via remote assistance in the Test Area Autonomous Driving Baden-Württemberg (TAF BW). The demonstration was given at Campus East of the Karlsruhe Institute of Technology (KIT) during the closing event of the KIGLIS research project as part of the KIT Science Week. KIGLIS is aimed at the optimization of fiber-optic networks via Artificial Intelligence (AI), thereby boosting sustainability of life in the future. The smart city network infrastructure developed within the project is also intended to be applied on autonomous driving.

Karlsruhe, 10/13/2023 – How can AI significantly improve peak time performance and reliability as well as cost and energy efficiency of upcoming fiber-optic networks in the smart city of the future? This was the question investigated for a duration of three years by the KIGLIS project (in German: Künstliche Intelligenz zur Optimierung von Glasfasernetzen in einer intelligenten Stadt), primarily funded by the Federal Ministry of Education and Research with a sum of 4 million euros.

Support of autonomous driving via remote assistance in complex traffic situations successfully demonstrated

Whenever complex situations arise, the autonomous vehicles of the near future will still require occasional human support. In such cases, remote assistance can be used: The staff of control centers will remotely help the autonomous vehicle with the next actions to be taken. In the closing event of the research project the real-time capable connection of autonomous vehicles to a remote point of support was demonstrated. The assistance of autonomous vehicles via a control center can be required in certain cases, for example to ensure the continuous availability of a vehicle fleet. A prerequisite for this assistance is however the transmission of high sensor data volumes from the vehicles and, if applicable, from the infrastructure sensors. In order to ensure this transmission also in a future smart city with a high number of connected units and thus a high communication traffic load, the FZI Research Center for Information Technology investigated and developed in its KIGLIS project various methods dedicated to autonomous driving. This includes AI-based compression methods for LiDAR and camera data. In combination with the network infrastructure of the project partners it was possible to give a successful demonstration of the explored methods on the Test Area Autonomous Driving. Furthermore, the FZI Research Center for Information Technology investigated methods for the detection of so-called *corner cases*, rarely occurring traffic situations with a need for remote assistance.

Application requirements of a smart city

The KIGLIS research project focused on the application requirements of a smart city, basing its developments directly on the network and infrastructure planning of a fiber-optic access network.

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The key components for the setup of fiber-optic networks were analyzed and optimized in the project by means of various AI-based procedures. Combining sensor technology, training data and network diversity the aim was to develop new applications and concrete, future-oriented transmission methods on the basis of AI solutions. In the process, the project partners also investigated the limits of known AI procedures with respect to their applicability on network infrastructures.

Joint project partners with the FZI Research Center for Information Technology were the Karlsruhe Institute of Technology (KIT), Nokia Solutions and Networks GmbH & Co. KG, VPIphotonics GmbH, Atesio GmbH, Berlin and TelemaxX Telekommunikation GmbH.

For further information about the project please refer to https://www.fzi.de/project/kiglis/ and https://www.kiglis.de

For image material, please send a request to presse@fzi.de.

About the FZI Research Center for Information Technology

The FZI Research Center for Information Technology, with headquarters in Karlsruhe and a branch office in Berlin, is a non-profit institution for information technology application research and technology transfer. It delivers the latest scientific findings in information technology to companies and public institutions and qualifies individuals for academic and business careers or the leap into self-employment. Supervised by professors from various faculties, the research groups at the FZI develop interdisciplinary concepts, software, hardware and system solutions for their clients and implement the solutions found as prototypes. The FZI House of Living Labs provides a unique research environment for application research. The FZI is an innovation partner of the Karlsruhe Institute of Technology (KIT) and strategic partner of the German Informatics Society (GI).

More information

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