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Collaboration with TU Wien and software specialist emotion3D creates synergies

As part of the "CarVisionLight" research project, ZKW is working with the Vienna University of Technology and software specialist emotion3D to develop intelligent light technology solutions. The project focuses on automatic image capturing and processing in traffic and adaptive lighting systems. The objective of this industrial research is to create lighting systems that "think with you," and that can approach or even exceed the capabilities of human perception. CarVisionLight is funded by the Federal Ministry of Climate Protection, Environment, Energy, Mobility, Innovation and Technology, and is part of the ZKW technology program for sensor integration. The program also includes the "Dragonfly" project, which integrates sensors and cameras in headlamps to facilitate automated driving functions. "With CarVisionLight, we are combining our expertise with our partners to develop lighting systems for the next generation of cars" says Oliver Schubert, CEO of the ZKW Group.

Safety as the Engine of Research

Light is the central factor when it comes to traffic safety. Modern vehicle lighting systems support optimal street lighting with automatic lighting functions, cameras and sensors. There is significant room for improvement, however, in terms of the automatic recognition of people, animals, and objects – especially at night. Currently, for instance, system designers lack valid data on the distance from which and the reliability with which a pedestrian can be detected by an intelligent lighting system at night. Because of this, ZKW worked with TU Wien to carry out extensive measurements to improve automated detection and increase safety during night-time driving.

Intelligent Lighting Thanks to Artificial Intelligence

As part of the CarVisionLight research project, a camera prototype was installed in a test vehicle in order to collect data for camera image processing in different daytime and nighttime traffic situations. Information was analyzed and patterns were detected with the help of artificial intelligence and monitoring software from emotion3D. These patterns can be transmitted to intelligent camera systems as "lighting algorithms" to improve system precision. "Camera-based 3D scene analysis under difficult night-time conditions, at high speeds, and at long distances represents a major challenge for the sensors, lighting, and image processing. Our intelligent image processing solutions can make a key contribution to better traffic safety and autonomous driving in this respect" says Dr. Florian Seitner, CEO of emotion3D.

Research as Part of a Culture of Innovation

With the CarVisionLight project, ZKW is pursuing a comprehensive approach that integrates research as a component of innovation. The lighting system specialist regularly works with universities like the Vienna University of Technology or Johannes Kepler University to do so, or with specialist companies like

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emotion3D. "We research image capturing and processing as well as adaptive lighting alongside our partners. Integrating 3D stereoscopy for environmental detection with high-resolution headlamp technology lays the groundwork for the next generation of headlamps. Our primary goal is to achieve the highest possible level of safety for night-time driving" Schubert explains.

Cooperation with Vienna University of Technology

Currently, ZKW is supporting two dissertations at the Vienna University of Technology on the topic of image recognition. Dr. Margrit Gelautz from the Institute of Visual Computing and Human-Centered Technology at the Vienna University of Technology says: "We are developing new image processing and machine learning methods that facilitate the analysis and interpretation of traffic scenes even in difficult conditions and during night-time driving. Collaborating with ZKW and emotion3D allows students to deal with current topics related to autonomous driving in their dissertations. These are relevant for both basic research and industrial applications."



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