

Bavarian Joint Project for InnoTrans 2024

Tram simulator brings tram driver assistance systems to life

Berlin / Ottobrunn near Munich, 19 September 2024. How driver assistance systems will be able to make tram transport safer in the future can be experienced at the InnoTrans trade fair in Berlin with a unique new tram simulator. In an original tram driver's cab, visitors to the trade fair will be able to virtually steer a tram along a route in the city of Munich and receive support from driver assistance systems. The tram simulator will be presented during the InnoTrans exhibition from 24 - 27 September 2024 at the IABG booth in City Cube A / 240.

The joint project has been organized by the Industrieranlagen-Betriebsgesellschaft mbH (IABG) based in Ottobrunn, Germany, together with the consortium partners Stadtwerke München GmbH (SWM) and GERSYS GmbH. The main focus of the IABG is on ensuring the safety of new mobility concepts and technologies. GERSYS, a company of the HÜBNER Group, is a leading supplier of instrumentation for the cockpit of railway locomotives and special-purpose vehicles. Another project partner is the 3D visualization company optify GmbH based in Darmstadt, Germany. They have provided the digitalization of the tram route in Munich used in connection with the simulator.

Presentation of the project results and a visit from the Bavarian Transport Minister

The project partners will present the project results on Wednesday, September 25, 2024, starting at 12:30 p.m. at the joint CNA booth in City Cube A / 240. **Christian Bernreiter, Bavarian Minister of State for Transport**, will get a first-hand impression of the tram cockpit of the future in a visit earlier that day at 8.30 am.

Transit company as a pioneer of innovative mobility concepts

Due to the growing shortage of skilled personnel and with the aim of improving safety, Münchner Verkehrsgesellschaft mbH (MVG), part of SWM, is committed to developing the job of tram driver in new ways. **Oliver Glaser, Managing Director and Head of the Rail Division at MVG**, emphasizes the need to modernize and digitalize public transport operations through innovative mobility services: *“Assistance systems offer an opportunity to support tram drivers in their work and to further develop tram vehicles. The simulator makes it possible for us to virtually test various systems and to assess them in connection with different traffic situations. This helps us in making future decisions and will also aid us in making tram operations even more safe,”* comments Glaser.

Prototyping driver assistance systems for the next generation of trams

As progress is made towards fully autonomous, driverless tram operation, the current project is producing important solutions for today's requirements. Drivers are supported by assistance systems, which significantly reduce the likelihood of accidents, explains **IABG Managing Director Thomas Köhler**: *“In the field of driver assistance systems, we are developing state-of-the-art solutions that provide drivers with additional information. Cameras and LiDAR sensors on the vehicle detect obstacles in the route of the tram and around the vehicle and provide early warning of a possible collision. In the event of an emergency, the systems initiate*

measures independently to prevent personal injury, for example by emergency braking.” In addition to achieving greater safety, the project partners also hope to gain initial insights in the automation and networking of public transport. With the involvement of passengers, it is planned to design and directly implement customized automation solutions for testing using agile development methods. Even though numerous tests have already been conducted, autonomous tram operation is not currently planned in Germany in the foreseeable future, not least due to unresolved authorization issues.

Simulation in combination with hardware

The core element of the simulator is the virtual streetcar operation with (pre-)implemented driver assistance systems and the multifunctional displays from GERSYS as a digital interface. Based in Wolfratshausen near Munich, GERSYS develops on-board equipment for rail transportation and is one of the innovation leaders in this field. *“Our hardware provides the technical prerequisites for displaying customer-specific applications in the cockpit of a tram,”* says **Thorsten Sprenger, Managing Director of GERSYS**. At InnoTrans, GERSYS will be presenting its extensive product range at the HÜBNER Group booth in Hall 1.2, Booth 120.

Three GERSYS systems have been installed in the simulator for the tram cockpit of the future: two multifunctional displays (HMIs) of the types BC2980 and BC5480 as well as the “electronic rear-view mirror” VM1500 (video monitor). The graphic displays can, for example, transmit current technical values or live images from installed external cameras. GERSYS is already supplying multifunctional displays and electronic “rear-view mirrors” for the Munich public transit company involved in the project. *“This allows tram drivers to see in real time what’s happening around their vehicles,”* explains **Thorsten Sprenger**.

Simulator provides views from different perspectives

The tram simulator shows how this works in practice in an impressive way. To facilitate the most realistic and detailed operation possible, Optify rendered a section of a specific MVG route into a 3D digital model showing the track and the surrounding area. In cooperation with IABG, a complex simulation network was developed on the software side to depict various traffic situations that might occur in multifaceted tram operation. In addition to the simulated perspective from the driver's cab, interested visitors to InnoTrans can also slip into the role of a passenger or other traffic actors with the aid of virtual reality glasses in order to experience external human-machine interfaces.

Aim and benefits of the tram simulator

The tram simulator will be used as the development platform for user-centered prototyping of driver assistance systems that can be employed in the trams of the future. With the information gained in this way, the project partners will be able to generate reliable and verified requirement specifications to sue for tenders for the development of the required assistance systems. Transit operating companies can thus minimize the risk of placing incorrect orders and thereby save costs.

IABG | Industrieanlagen-Betriebsgesellschaft mbH

The IABG is a leading European technology company with its core competencies in analysis, simulation & testing, and system operations. The terms “safety and security” form the thematic umbrella of the company’s solution portfolio: The safety of newly developed high-tech products and transport systems as well as the security of the state, the economy and society. In this context, IABG provides technical and scientific services for private and public customers in many different industries: automotive, rail applications, energy technology, the public sector, aerospace and defence.

IABG employs 1,200 highly qualified staff at its headquarters in Ottobrunn as well as in customer-related offices in branches in Germany and abroad.

www.iabg.de

SWM | Stadtwerke München GmbH

SWM keeps Munich running around the clock: As one of the largest municipal companies in Germany, SWM works to provide a secure supply of energy, city-friendly mobility, future-ready telecommunications services and the best drinking water from the Bavarian foothills of the Alps. With these services, we make an important contribution to the social infrastructure and promote the economic strength and quality of life in Munich and the surrounding region. The mobility subsidiary MVG is responsible for subway, bus, tram and cycle services. With more than 11,000 staff, SWM is one of the largest employers in Munich.

www.swm.de

GERSYS GmbH | A company of the HÜBNER Group

As a leading provider of instrumentation in the driver's cab of rail and special vehicles, GERSYS develops and manufactures highly reliable on-board electronics such as graphic displays (HMI/IDU/MMI). The GERSYS product range includes vehicle computers, display systems and driver assistance systems that are based on the railway standards EN50155 and EN45545. These systems are known for their high quality and long product life cycles. Founded in 2001, GERSYS has its headquarters in Wolfratshausen, Germany, and has approximately 50 employees.

Since 2019, Gersys has been a wholly owned subsidiary of the HÜBNER Group – a global system supplier serving the mobility sector, manufacturing, life sciences and scientific applications. HÜBNER is the worldwide leader in gangway systems for rail vehicles and buses as well as a supplier of chassis technology, cockpit display solutions and door sealing and safety profiles. In addition to its headquarters in Kassel, Germany, HÜBNER is operating at more than 30 locations around the world.

www.gersys.de | www.hubner-group.com

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