

Newsletter 2021-1

DEAR READERS,

"The only constant in life is change" - this saying may bore many people due to its triviality or its enormous popularity. Nevertheless, it seems – at least in the area of mobility – to be more suitable as title for our current situation than ever before in its 2,500-year history. We are facing terms such as "traffic turnaround", "new mobility", "disruptive (drive) technologies" daily, and some of the developments triggered are being accelerated by the Corona pandemic.

We as VUFO are also part of this change; we can "measure" it in the form of the changing accident situation and "read" it from the current research questions and project contents. Our core project GIDAS, which has been continuously developing over more than 22 years, is also amid its greatest (r)evolution to date.

We are curious to see where accident research will develop in the future in the context of autonomous driving, electric driven vehicles, connected traffic and micro-mobility. With many developments initiated on our own initiative, including the reading of electronic vehicle data, 3D accident scene recording and the creation of scenario catalogues, we are helping to shape "our" future – true to the motto "Do a lot of new things without leaving behind the tried and tested".

As usual, we present some of these news, current projects, and developments of VUFO in this newsletter. On behalf of the entire VUFO team, I hope you enjoy reading this newsletter!



Henrik Liers

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GENERAL

Certification according to DIN EN ISO 9001:2015

For more than 20 years, we have strived to continuously improve the quality of the accident data we provide. This has played a decisive role in ensuring that the GIDAS database enjoys an excellent reputation worldwide.

But that's not all - in the context of all other services we provide as VUFO, the pursuit of high quality, continuous improvement and strong customer orientation is also our incentive. For this reason, we have established a quality management system at VUFO that provides the framework for quality-conscious thinking and action.

Based on the QM system established and practiced by all employees, all departments of VUFO were successfully certified according to DIN EN ISO 9001:2015 in July 2021.

We are convinced that the time and financial resources invested pay off in the long term. Optimized internal processes and documented workflows and procedures simplify, for example, the induction of new employees, enable the preventive identification of risks and weak points and form the basis for structured improvement measures.

In conjunction with our Project Management Office (PMO), which has also been newly established, measurable results are already being achieved in the form of increased customer and employee satisfaction.



Thomas Unger (QM Representative) and Henrik Liers (Managing Director) with the official ISO 9001:2015 Certificate

Project Management Office (PMO) at VUFO

From our many years of experience with over 400 successfully completed industrial and research projects, we know that efficient project management and organization are indispensable. While introducing the Quality Management system, we therefore also reviewed our processes in the area of project management and optimized our procedures.

Since March 2021, the Project Management Office is supporting us operationally and across projects as an interface for project and department management as well as controlling. All processes in projects are mapped and documented using project management software in order to monitor progress and implement control measures.

For our customers, the introduction of the Project Management Office has some advantages:

- High quality in project processing and efficient workflows
- Controlling and monitoring of processes during the entire project
- Timely delivery of reports and milestones
- Quick reaction to changes in the project
- Transparency in the resources and means used

As a partner in various consortium projects, we are very aware of the importance of project management for the fulfilment of project objectives. We are sure that VUFO has the necessary resources, expertise, and methods to also act as coordinator / project manager in consortia and funded projects.

New employees

Our accident investigation team has been strengthened by our new technician Samuel Marschner since March 2021. He has successfully completed his professional development as a mechatronics technician in the truck sector and brings with him basic anatomical knowledge – a perfect combination for our interdisciplinary approach in the GIDAS project.

Annamaria Gothan supports us in the areas of quality management and public relations since the beginning of this year. In addition to the creation and maintenance of the new VUFO website and the communication on social media platforms, Ms. Gothan is also part of the QM team and supports the Project Management Office in the Data Analysis and Simulation department.



From left to right: Samuel Marschner, Peter Miklis, Annamaria Gothan, Lucas Dulewicz, Arsenii Shishkov

With our new research associates Peter Miklis, Arsenii Shishkov and Lucas Dulewicz, the department of Data Analysis and Simulation was also further expanded. The three graduates from Saxon universities are supporting us within various national and international research projects as part of their induction. In addition, they are increasingly involved in our R&D activities.

We are proud that we were able to win the five "newcomers" for our VUFO team - despite the shortage of specialists and the effects of the Corona pandemic. We are looking forward to a long-term and fruitful cooperation!

New website

DATA INVESTIGATION

New investigation car

Since April 2021, the VUFO survey team has a new investigation vehicle. The official handover of the VW T-Roc, which replaces the aging VW Touran, took place at the Volkswagen dealer Dresden Reick. The vehicle is highly appreciated by our medical team staff (and apparently also by our managing director), not least because of the elevated seating position, which facilitates driving under operational conditions. Drivers have a good overview of the traffic situation which is important, especially during emergency trips.



With our website www.vufo.de we inform you about current VUFO projects, news, and interesting facts from the field of accident research and traffic safety. In addition, the homepage provides insights into our fields of activity and services and informs about the current trainings and seminars.

There is also a page with our latest publications on conferences, in journals or newspapers, usually with the possibility to download the papers or presentations.



Creation of 3D accident environments by means of photogrammetry

The classic accident sketch as one result of the accident site documentation and basis for the accident reconstruction usually is a 2D representation of the accident site. For a more realistic reconstruction, but also a better understanding of the accident for external observers and the users of GIDAS data, a visualization in 3D is desirable.

The VUFO team has therefore been intensively researching a standardized, high-quality methodology for the 3D investigation of scenes that can be applied under operational conditions at real accident sites.

The result of our work is a robust method for photogrammetric recording of the accident site using an action cam (GoPro) mounted on a 5m tripod. Conditions for the application of this optical methodology are, of course, good visibility and appropriate weather conditions. Furthermore, only few static vehicles should obscure the view of relevant elements (tracks, final positions, splinter fields, objects, etc.). Interfering effects caused by passing vehicles, on the other hand, can be easily eliminated in the post-processing stage.



Documentation of braking and skidding marks, vehicles, objects and other relevant aspects in a point cloud

All relevant traces, objects, and the paths of those involved in the accident are rather simply recorded by walking through the accident site.

The use of the 5m high tripod and an appropriate post-processing process with Agisoft® delivers excellent results. The investigation at the accident site takes no longer than the creation of a complex 2D accident sketch and has a much higher accuracy.

In addition to the colored 3D point cloud environment, an orthophoto can of course be plotted as basis for creating a classic 2D accident sketch.



3D point cloud of an accident site

We are currently testing further possibilities to create the 3D point clouds even faster and to evaluate it in more detail. The aim of the current intensive test phase, which is at first carried out by our experienced technicians, is the standardized use of this method by the entire technical investigation team.

Since we are investigating accidents in all conceivable weather, light and environmental conditions, we do not limit ourselves to photogrammetric recording. At selected accident sites, we use our Leica Laser scanner or our aerial photograph drone. We have also set up suitable processes for the application and post-processing (creation of 3D point clouds in various formats).

Certainly, it will not be necessary to capture the environment in 3D for every accident in the future. However, 3D point clouds of accident sites provide a valuable basis for realistic reconstructions, simulation scenarios and visualizations in 3D.

Basic course Accident Reconstruction

Our “Basic course Accident Reconstruction” will take place again as a classroom event in Dresden in autumn 2021 (in German).

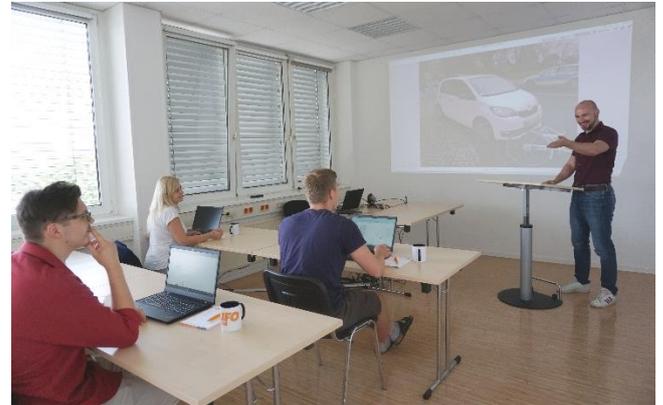
In cooperation with the renowned instructors and accident experts Dr. Heinz Burg and Jochen Lehmkuhl, we provide participants with comprehensive knowledge in the field of accident analysis and documentation in three 4-day modules.

The contents include methods of accident investigation, special aspects of the expert's work and the reading of electronic vehicle data from accident vehicles. The second focus is on teaching the theoretical principles of accident reconstruction, followed by practical application on the basis of real example accidents.

The course will take place on the following dates:

Accident investigation	06.10. – 09.10.2021
Theoretical foundations	10.11. – 13.11.2021
Practical reconstruction	24.11. – 27.11.2021

More information on the individual modules, which can also be booked individually, can be found on our [website](#).



We are happy to accept registrations via our online form or by e-mail. For further information, please contact Thomas Unger at the following address:

Phone: 0351 / 43 89 89 35

Email: weiterbildung@vufo.de

We are looking forward to your participation!

DATA ANALYSIS AND SIMULATION

FAT project – Objective assessment of the quality of databases for use in the research and vehicle development

Contact person: Dipl.-Ing. Johann Ziegler

After completion of the project, which was conducted in cooperation with the Fraunhofer Institute for Transportation and Infrastructure Systems (IVI), the research report was published as part of the “FAT Schriftenreihe”.

The main objectives of the research project included the inventory and evaluation of national and international data sources in order to be able to answer questions regarding assisted, connected, and automated driving. VUFO managed the research project, developed and compiled the results database, and inventoried corresponding in-depth data sources of selected countries.

The project makes an important contribution to the data-driven improvement of traffic and vehicle safety. Clear evidence of the importance of the project and the success of our work is the fact that the project is now being continued, which will include setting up a web-based database with expanded content.

The research report is available for download [here](#) (in English only).

Project duration: January 2020 - March 2021

We would like to thank the Forschungsvereinigung Automobiltechnik (FAT e.V.) for funding the project and for publishing the project results as part of the FAT publication series.

ErVast - Use of dynamic traffic elements for testing automated driving functions

Contact person: Dipl.-Ing. (FH) Marcus Petzold

The increase in road safety aimed at with the introduction of automated and connected driving functions can only be achieved by sufficient methodical examinations of the vehicles. This should address the design, condition, function, and effect of the automated and connected driving functions within the framework of the main inspection over the entire vehicle life.

Under the leadership of FSD Fahrzeugsystemdaten GmbH, in the "ErVast" project, various partners in addition to VUFO are developing a test procedure for investigating automated and connected driving functions. In the future, these can be used, for example, as part of the Periodical Technical Inspection (PTI) of motor vehicles.

The basis for a comprehensive investigation of these driving functions is a research of applicable national and international regulations, existing test protocols, and evaluated accident scenarios.

Within the project, VUFO is working on the derivation of test scenarios based on real traffic accident data. In the first step, different accident scenarios are analyzed and grouped based on the GIDAS database.

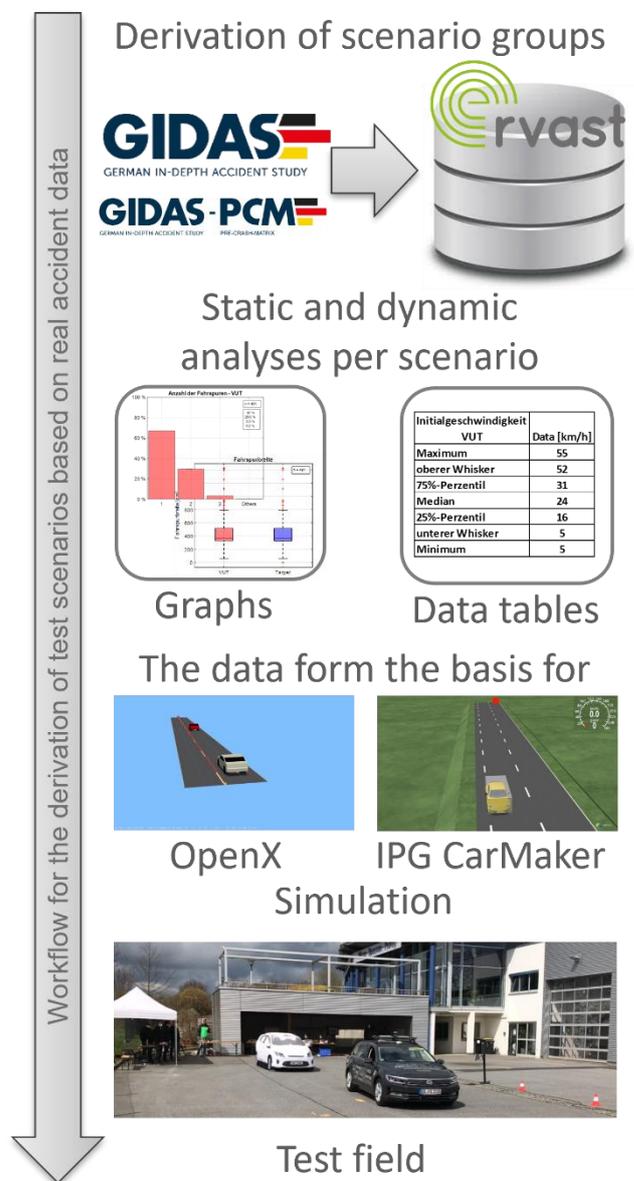
The focus in the ErVast project is on accidents in urban areas involving passenger cars. For these accidents, further analyses of the vehicle dynamics and the static elements of the accident environment are carried out. Subsequently, relevant parameters (e.g. positions, speeds, accelerations of the participants, road characteristics, etc.) are identified for test scenarios.

Finally, exemplary test scenarios are transferred into different formats like IPG CarMaker and OpenDRIVE / OpenSCENARIO).

With the prototype of the developed test scenario pool a vehicle-model-specific investigation can be carried out with appropriate test setups.

The project is funded within the framework of the AVF (Automated and Connected Driving) program of the German Federal Ministry of Transport and Digital Infrastructure.

Project duration: January 2020 – December 2021



Flowchart of scenario creation based on real accident data from the GIDAS database

LEONARDO - MicrovehicLE fOr staNd-Alone and shaReD mObility

Contact person: Dipl.-Ing. (FH) Daniel Grosche



LEONARDO is a European H2020 project that conducts research on the safety, use, and cost reduction of micro electric vehicles in public road transport.

The aim is to develop a new vehicle concept in the field of micro mobility with improved energy efficiency, increased safety as well as new solutions for system integration, e.g. with a modular battery pack. A prototype will be tested in various European cities.

VUFO is involved in the creation of safety-related technical and legal requirements for the vehicle concept to be developed in LEONARDO. Furthermore, we are investigating accident figures as well as user requirements by questionnaires in several countries.

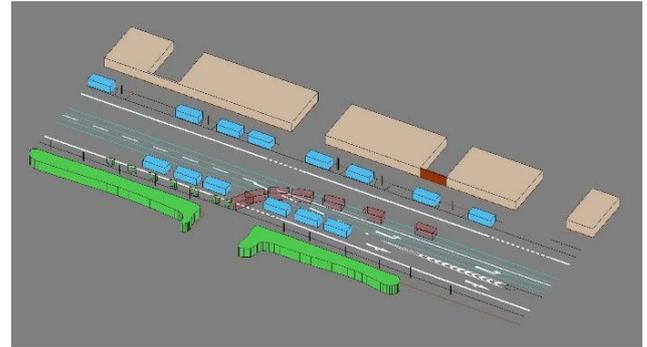
The project started in January 2021 and will run for three years. Further information on the LEONARDO project can be found [here](#).

New release of the GIDAS-PCM database

Contact person: Dipl.-Ing. (FH) Marcus Petzold

Since 2011, VUFO has been generating a database that is used for simulation-based analyses and evaluations of real accidents. The scenarios are based on the data and reconstructions of GIDAS accidents. The current release of the GIDAS-PCM contains 10,851 pre-crash scenarios from accidents with personal damage.

The PCM (Pre-Crash Matrix) is an open and freely available format developed by VUFO to describe the pre-crash phase of traffic accidents. The PCM v5.0 format specifications enable the description of participants, their dynamics, and the environment. The visualization of the accident can take place in a 2D or 3D environment.



PCM scenario of a real accident from the GIDAS database, visualized with the PCM viewer of VUFO

In addition to accident data, real driving data (NDS) can also be stored in the PCM format. Due to similar contents and structures, PCM data can also serve as a basis for other simulation formats (OpenDRIVE, OpenSCENARIO).

In addition, VUFO offers suitable conversion tools that allow the creation of accident scenarios in vehicle dynamics solvers (e.g. IPG CarMaker, dSPACE ASM).

If you are not interested in receiving our newsletter in the future, please inform us briefly by e-mail to unsubscribe@vufo.de.

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