

AVL University Partnership Program



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We support research and teaching activities in academia by offering our unique AVL University Partnership Program (UPP), addressed to Universities, Technical Universities, Universities of Applied Sciences, Technical Colleges and Technical High Schools. Within the frame of the program, we provide access to our comprehensive set of outstanding simulation, virtualization, and data analysis solutions. For our UPP partners we offer the opportunity to use the latest software technology of the world's largest independent company for the development, simulation and testing of powertrain systems for scientific research and educational purposes. Participation in the UPP enables the education of students at the highest possible standards and also offers young researchers to efficiently perform their research work on engine, powertrain and vehicle related component and system level analysis and optimization.

Details of Partnership

Within the UPP, AVL provides up to 30 licenses per product for teaching and noncommercial research. Basic and expert trainings as well as certain hardware are offered at special rates. Provided that a basic training course is attended, email support of up to ten hours is given free of charge for each software product. Licenses are valid for twelve months, six weeks before the license period ends UPP partners are asked to fill in an online feedback form. Deliverables provided by the institute are evaluated and the licenses will be renewed.

Deliverable/AVL:

- We deliver up to 30 licenses per product
- Selected software tools are listed below
- Certain products require hardware

Deliverables/Institute (minimum three options) collected via FEEDBACK:

- Providing a short video/picture from your calculations including a description and name(s) of responsible for public use (i.e. AVL LinkedIn page)
- Mentioning the use of AVL software in internal or external communication channels
- Papers on conferences/in journals acknowledging the use of AVL software
- Successfully accomplished BSc/MSc/PhD Thesis in which any PROGRAM was used
- Organizing courses/seminars/conferences for participants from industry and academia including AVL members to present
- Collaboration in internationally and nationally funded R&D projects
- Link to your webpage at which the AVL University Partnership Program is mentioned

Selected Software Tools:

The software development in close interaction with leading academic institutions and the automotive industry has resulted in the dedicated engineering tools AVL CRUISE™ M, AVL Scenario Designer™, AVL Scenario Simulator™, AVL FIRE™ M, AVL EXCITE™ M, Model.CONNECT™, FIFTY2 PreonLab, AVL VSM™, AVL-DRIVE™, AVL CONCERTO 6™, AVL M.O.V.E DATA TOOLBOX 2, AVL BEAT™, AVL CAMEO 5™, and AVL Virtual Studio OPEN which have successfully proven to cover major aspects of engine, powertrain and vehicle related simulation tasks.

AVL Software Tools

The software suite offered within the UPP reflects our unique experience in the areas of engine and powertrain engineering.

Simulation Software



AVL CRUISE™ M – Powertrain System Simulation

The system simulation tool AVL CRUISE™ M is designed for model-based system development, seamlessly integrating high-fidelity realtime-capable sub-system models of engine, aftertreatment, fuel cell system, battery pack, power electronics, cooling and HVAC and control system domains. The efficient numerical solver, tailored for efficient multiphysics system simulation is combined with a highly flexible, multi-detail level modeling approach, open to third party tools and interface standards (FMI). This allows the re-use of CRUISE M sub-system and overall vehicle powertrain system models in all phases of the development process, from concept and layout in the office through to testing support and calibration on realtime HiL and test systems.

ADAS Solutions

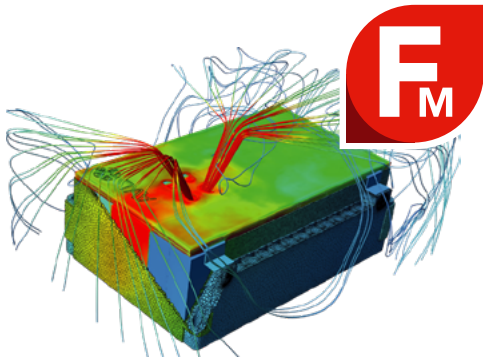
AVL Scenario Designer™ – Open. Easy. Safe.

AVL Scenario Designer™ is a software tool for easy traffic scenario design, editing, parametrization and verification. It supports import and export of scenario files in ASAM OpenSCENARIO standard. As part of the AVL SCENIUS™ toolchain, it is seamlessly integrated with the Scenario Data Manager and the Test Cast Generator. Further, it is compatible with leading commercial and open-source tools for environment simulation.



AVL Scenario Simulator™ – The Cost-Optimized Solution for Fully Automated, Large-Scale ADAS/AD Testing

AVL Scenario Simulator™ is a high-performance simulation platform that includes sensor and vehicle dynamics models. Further, open interfaces to integrate other simulation models or tools and of course the ADAS/AD software under test. Thanks to this modularity, the user can define the optimal virtual prototype for each test purpose. Coming with an outstanding support of the ASAM OpenSCENARIO® XML standard, users can import test definitions from various sources, configure parameter variations and run the simulations in parallel on a workstation or in the cloud.

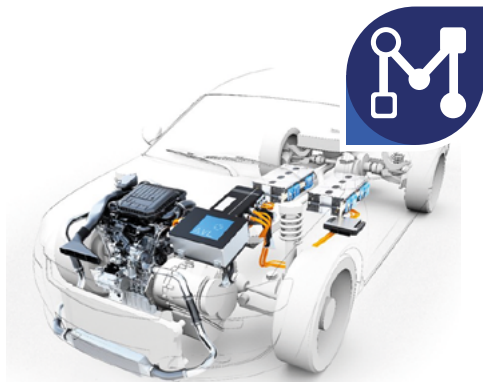


AVL FIRE™ M – 3D Multiphysics CFD

AVL FIRE™ M is AVL's next generation 3D multi-physics simulation solution for application to future vehicle powertrain components. It comprises the latest technology with regards to model generation and solver technology as well as physical, chemical and electrochemical modelling. FIRE M covers arbitrary geometrical complexity levels and multiple fluid-solid domains, as well as it allows to perform fast and robust multi-physics analysis that can easily be managed even by non-expert CFD users. The application fields cover, in addition to the traditional ones, also all kinds of electrical powertrain components like battery, fuel cell, e-motor and power electronics.

AVL EXCITE™ M – Durability and NVH of Power Units and Drivelines

Using advanced modelling techniques, AVL EXCITE™ M calculates the dynamics, strength, vibration and acoustics of combustion engines, e-motors, transmissions of conventional and electrical powertrains and drivelines under real operating conditions. Sophisticated models for lubricated contacts like gears, cams, roller bearings, slider bearings, piston and piston ring/liner contact support the design analysis of these components by enabling the detailed investigation of key functions such as friction, wear, performance and durability. Embedded workflows guide through the process from FE-modeling, dynamic model setup and simulation till application tailored result assessment.



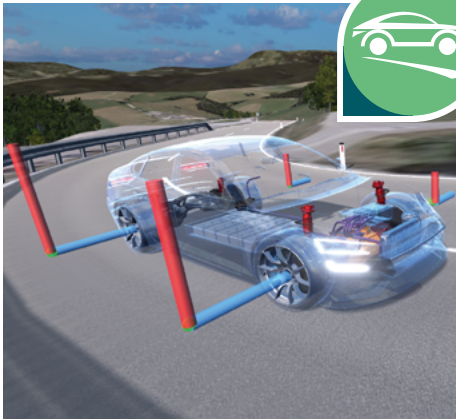
Model.CONNECT™ – Enrich Your Reality

Model.CONNECT™ is AVL's open model integration and co-simulation platform. It helps you to connect your existing simulation models, created with different simulation tools, to a consistent virtual prototype. Also, the connection of virtual and real components is possible. This model-based development approach results in cost benefits and efficiency increase across your entire development process. The solution is applicable in a broad range of powertrain and vehicle applications (e.g. vehicle dynamics, energy management, real driving emissions, advanced driver assistance systems). With the main focus always on the system as a whole, Model.CONNECT enables early, fast and sound decisions at all stages of the development process.

FIFTY2 PreonLab – Disruptive Meshless CFD

The PREON® technology is the result of intensive research with one goal: Finding a new approach for fluid simulation that allows for physically accurate simulations in unprecedented resolutions. With PREON® at its core, PreonLab allows simulations using large time steps without compromising on simulation quality. Moving geometries are handled completely without re-meshing. Finally, it employs highly efficient data structures and full parallelization using a state-of-the-art hybrid parallel programming implementation which gets the best performance out of your desktop PC or your high-performance cluster. PREON® means less computation time and faster answers.





AVL VSM™ – Efficient Driving Pleasure

AVL VSM™ is a powerful and comprehensive vehicle simulation platform to accurately predict vehicle behavior and optimize key performance attributes - such as efficiency, drivability, performance, handling, ride comfort, and lap time - across all stages of development, from initial concept through to virtual calibration and testing.

With advanced modeling capabilities and user-friendly parameterization tools, including the 3D Track Editor, Maneuver Designer, 3D Visualization, GPS/Google Maps Importer, and K&C Importer, AVL VSM™ streamlines the simulation process for maximum efficiency and precision, enabling the usage of one model in different environments.

AVL VSM™ simplifies and accelerates virtual vehicle development activities, significantly reducing reliance on physical prototypes, costs and time-to-market.

AVL-DRIVE™ – Objective Assessment of Vehicle Attributes

Shape your vehicle's character and develop its distinctive driving DNA. Break free from subjective testing limitations, evaluate countless maneuvers and objectify driving attributes in a reproducible and user-friendly way. In real-time, throughout all development phases, in the virtual and real world.

Full Objectivity Ahead

Reduce development costs and time to market. Objectivity is AVL-DRIVE's primary objective. Generate, objectify and reproduce real-time data in terms of drivability, ride comfort, handling and ADAS, for all engine and powertrain systems. Monitor and adapt changing input criteria, manage any form of increased vehicle complexity - from models to prototypes, from benchmarking to the final approval.

Buckle up for the Future With the Experience of the Past

Benefit from one of the largest benchmarking data pool worldwide. Why does AVL-DRIVE rate 100+ automated and even overlapping maneuvers in the most objective way possible? Because the software is based on thousands of benchmark datasets and volunteer studies collected over the past 25 years in the automotive field. And because an experienced pool of experts worldwide continues to improve and adapt to changing criteria with care and confident instinct.



Data Acquisition and Analysis Software



AVL CONCERTO 6™ – Experience the Harmony

AVL CONCERTO 6™ is a comprehensive data analysis and visualization tool designed to handle the vast amounts of data generated during vehicle development and testing. It simplifies the process of analyzing and interpreting data, making it accessible and actionable for engineers and decision-makers.

AVL M.O.V.E DATA TOOLBOX 2 – Efficient and Flexible PEMS Data Post-Processing

The M.O.V.E DATA TOOLBOX 2 is a powerful software add-on for AVL CONCERTO 6™, the AVL data post-processing platform. It supports different global real-world emissions regulations and applications. Versatility and efficiency is provided by continuously updated support of various regulations:

- Light-duty (EU RDE package 5, China 6, India AIS 175, etc.)
- Heavy-duty (HD ISC, China VI, US HDIUT, US CARB 3 Bin, etc.)
- Non-road mobile machinery (EU NRMM ISM, CHINA IV NRMM)



AVL BEAT™ – Data Acquisition Excellence

AVL BEAT™ is a state-of-the-art software solution for data acquisition, real-time processing, and analysis in R&D and industrial environments. It helps engineers and facility managers efficiently handle complex testing tasks in the energy and mobility sectors. With high-quality data, intuitive visualization, and KPI generation, AVL BEAT™ enables fast and traceable decision-making.

The huge range of applications covers:

- Combustion pressure measurement for ICE (internal combustion engine)
- Optical measurement and temperature measurement for ICE
- Hybrid measurement (combustion measurement combined with e-power)
- E-power measurement (inverter and e-motor power analysis)
- E-drive optimization in combination with DoE (Design of Experiment)
- Energy flow/energy metering (charger, in-vehicle, etc.)
- Battery testing (EIS – electrochemical impedance spectroscopy)
- NVH (noise vibration harshness) and dynamic torque analysis

Smart Calibration and Virtual Testing Software



AVL CAMEO 5™ – Beam Yourself into a New Realm of Automotive Testing, Calibration, and Validation

AVL CAMEO 5™ with its new integrated Functional Testing for Automotive Software, opens up a new dimension of superlatives for the DevOps engineer in automotive development. With new interfaces to SiL, HiL and in-vehicle it expands its activities to the necessary test environments. With the ability to interface to software test automation pipelines and software life cycle management tools, the integration in a DevOps toolchain is made possible. CAMEO is the most efficient, independent, and goal-oriented validation and verification software for test sequencing, design of experiments (DoE), and optimization. Minimize your effort in any test environment and create a new continuum with endless possibilities and ADAS systems, as well as the more traditional ICE and hybrid.

AVL Virtual Studio OPEN – Connecting Development Activities for a Seamless Workflow

AVL Virtual Studio OPEN helps you harness the benefits of model-based testing. As an open platform it facilitates early integration tests by connecting simulation models to the testbed. In alliance with Model.CONNECT™ it opens the testbed to the whole world of office simulation. This prevents long wait times for prototype components or vehicles and allows for quicker and more powerful decision-making throughout the entire development cycle. AVL Virtual Studio OPEN ensures a seamless connection between advanced office simulation and their utilization in the testfield: be ready to overcome department boundaries.



FIND OUT MORE

AVL List GmbH
Hans-List-Platz 1, 8020 Graz, Austria

Email avl_upp@avl.com
www.avl.com

Embedded Software Development



AVL Maestra®: Your Toolchain for Software Development

Developing software for use in vehicles requires compliance with quality and safety standards such as Automotive Spice (ASPICE) and ISO 26262. The toolchain AVL Maestra® enables you to implement these requirements with your software with maximum efficiency. Various individual programs are used to solve all the challenges of software development. Each of these software solutions requires its own operation, configuration, and compatibility with the other programs in the toolchain. We know that there is an easier way. Maestra is our solution for your process-compliant development and assurance of software functions.

- Our integrated development toolchain combines all required functions for model-based software development in a uniform user interface. For user-friendly operation and rapid update cycles.
- Integrated quality metrics and automated checks ensure your software development is always process compliant. For example, checks are run to see whether all planned requirements have been tested, and the programming code is of the best quality. A quantum leap in meeting standards.
- Maestra creates virtual electronic control units (vECUs) automatically, for example, for ADAS or AD functions. This allows you to test and calibrate control unit functions in an early simulation phase, to align them with the real-world vehicle. The advantage being that you do not need real-world hardware, which saves time and money.

FIND OUT MORE

AVL List GmbH
Hans-List-Platz 1, 8020 Graz, Austria

Email avl_upp@avl.com
www.avl.com