AVL University Partnership Program

AVL

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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 at an annual license fee of € 0 per product
- Certain products may require an application process

Mandatory Deliverable/Institute:
- Providing a short video/picture from your calculations including a description and name(s) of responsible for public use (i.e. AVL LinkedIn page)

Deliverable/Institute (minimum two options per product):
- Mentioning the use of AVL software in the annual institute report
- More than two papers on conferences/in journals per year acknowledging the use of AVL software
- Offering courses/seminars for industry including AVL members to present
- Collaboration in R&D projects
- Providing R&D results obtained with or to be built in AVL software
- Internet link to AVL website

(Deliverables may differ depending on software product and are defined in the License Agreement.)

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 FIRE™ M, AVL EXCITE™, Model.CONNECT™, FIFTY2 PreonLab, AVL VSM™, AVL CONCERTO 5™, AVL M.O.V.E DATA TOOLBOX 2, AVL INDICOM™, AVL CAMEO 5™, Testbed.CONNECT™, AVL Smart Mobile Solutions™, AVL VSM™ RACE and AVL DRIVE™ RACE 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.

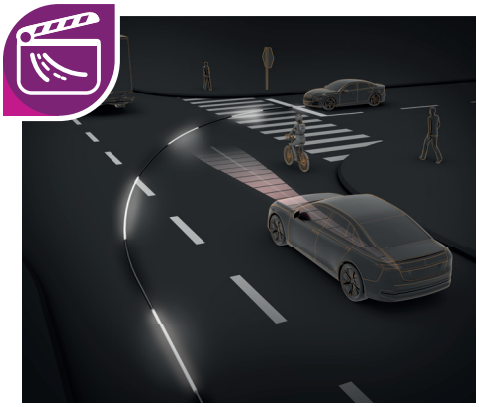
Simulation Software

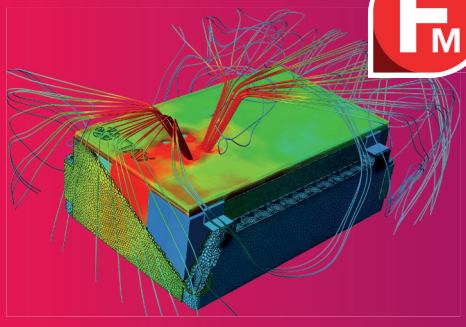
AVL CRUISE™ M – Powertrain System Simulation

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.

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 FIRE™ M – 3D Multiphysics CFD

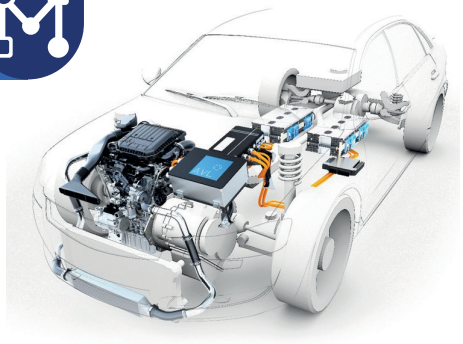
AVL FIRE™ M is AVL's next generation 3D multi-physics simulation solution for application to future vehicle powertrain components. It comprises the latest technology with regards to model generation and solver technology as well as physical, chemical and electrochemical modelling. FIRE M covers arbitrary 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™ – Durability and NVH of Power Units and Drivelines

Using advanced modelling techniques, AVL EXCITE™ 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.

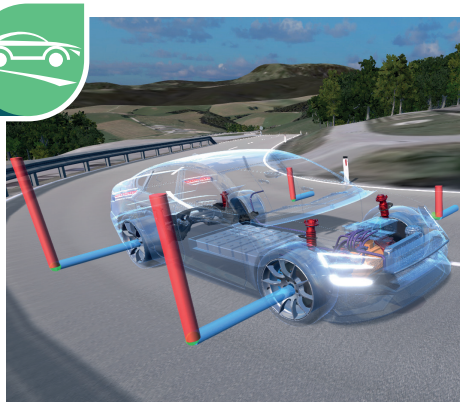


FIFTY2 PreonLab – Disruptive Meshless CFD

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 comprehensive vehicle simulation package that precisely predicts the vehicle behavior and enables the improvement of vehicle attributes (e.g. efficiency, driveability, performance, handling, ride comfort or lap time) from the initial concept to the testing phase. VSM supports an efficient vehicle development process through powerful and precise modelling as well as convenient parameterization features (3D Track Editor, Maneuver Designer, 3D Visualization, GPS/Google Maps Importer or KnC Importer). VSM supports an early solution to the conflicting goals of vehicle efficiency and driving pleasure. It accelerates and simplifies the calibration and validation tasks and significantly reduces the number of vehicle prototypes.



Data Acquisition and Analysis Software

AVL CONCERTO 5™ – Experience the Harmony

AVL CONCERTO 5™ is the holistic, open and adaptive data analytics solution of the future. With built-in and ready to use domain know-how, it empowers data-driven engineers to become a strong development influencer: ready for big data, highly performant, interconnected, time and location independent. It is the generic data processing platform for visualizing, analyzing and reporting many measured and simulated data types. Its powerful extension options enable the individualization of the tool functionalities that turn data collected throughout the vehicle development process into decision-relevant information.

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 5™, 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 packages 4, China 6, India, etc.)
- Heavy-duty (EU HD ISC, China V and VI, US HDIUT, etc.)
- Non-road mobile machinery (EU NRMM ISM, CHINA IV NRMM)

AVL INDICOM™ – Data Acquisition Excellence

The AVL INDICOM™ software platform in combination with our modular and powerful data acquisition system AVL X-ion™ provides fast result monitoring, dynamic testing and unique, smart, raw data recording.

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 a well as the more traditional ICE and hybrid.

Testbed.CONNECT™ – Connecting Development Activities for a Seamless Workflow

Testbed.CONNECT™ 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 and vehicles and allows for quicker and more powerful decision-making throughout the entire development cycle. Testbed.CONNECT ensures a seamless connection between advanced office simulation and their utilization in the testfield: be ready to overcome department boundaries.

AVL Smart Mobile Solutions™ – Bridging the Gap Between the Lab, the Office and the Road

AVL Smart Mobile Solutions™ are a range of testing and calibration tools that are designed to manage these activities and reduce testing effort. You can use them with existing vehicle setups for both passenger and commercial vehicles. Smart Mobile Solutions is designed to support you throughout the whole process, resulting in increased overall productivity and test efficiency. As well as enabling tasks to be conducted in the vehicle, they also support tasks you conduct in the office, such as preparing tests and analyzing results. They also support the shifting of tests from the road into simulation or testbed environments.

*Racing Software**

AVL VSM™ RACE – Vehicle Dynamics Simulation

We have developed a real time Vehicle Simulation Model (VSM) for racing applications, in order to simulate the dynamic behaviour of a race on the track with an Office PC/Laptop and in HiL applications (e.g. engine test beds, driver simulator, etc.). The tool includes models for engine, suspension, chassis, aerodynamics, differential, gearbox, tyres, brakes, steering, driver and track. With AVL VSM™ RACE Offline it is possible to modify vehicle set-up, track or driver parameters and run hundreds of laps using a local PC. By using a state-of-the art cloud computing environment thousands of laps can be simulated within a few hours.

AVL DRIVE™ RACE – Data Viewing and Analysis

AVL DRIVE™ RACE is a software tool for data visualization and vehicle analysis. In general, it is used as an offline tool analyzing data files to speed up and objectify the data evaluation of track telemetry outputs, simulation results and many more sources. The software tool evaluates more than 300 single drivability and performance criteria of engine, drive train, traction control, chassis and driver.

*Please submit your formula student team's application until October 31.

FIND OUT MORE

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Version 2023.1