

First public WORKSHOP on Vehicle Concept Modeling



VECOM

Vehicle Concept Modelling

www.vecom.org

To register for this event, please contact:
Helmut Kühnelt (helmut.kuehnelt@ait.ac.at).

Seminar & Hands-on tutorials Vienna, 27th to 28th October 2010

AIT Austrian Institute of Technology
Mobility Department
Giefinggasse 2, 1210 Vienna, Austria

VECOM Partners

Universities: UPVLC Valencia (coordinator), Politecnico di Torino, K.U.Leuven,
Univ. Firenze, Aristotle Univ. Thessaloniki, Czech TU Prague

Research Institutes: IDMEC, Fraunhofer-LBF, AIT Austrian Institute of Technology, IFP

Industry: LMS International, AVL, CRF, BMW

VECOM originates from, and is fully endorsed by EARPA, the European Automotive Research Providers Association of which several partners are active members in the Task Force "Modelling and Simulation", see <http://www.earpa.org/>.

AGENDA

Wednesday, Oct 27th, Morning

8:30	Reception desk open	
9:00	Helmut Oberguggenberger, Head of Business Unit EDT, AIT Mobility Department	Welcome, AIT Introduction
9:15	Xandra Margot, VECOM Coordinator, Polytechnic University of Valencia	VECOM Introduction
9:25	KEYNOTE: Dr. Christian Kral, Senior Scientist, EDT, AIT Mobility Department	“Electric Drive Modeling and Design”
10:10	Pavlina Mihaylova, University of Firenze	“On the Improvement of a Model Updating Method for Concept Studies with Application to Structural Dynamics”
10:30	Izabella Kowarska, Centro Ricerche Fiat	“Multi-objective Optimization in Vehicle Concept Modeling”
10:50	Coffee Break	
11:10	Sergii Bogomolov, Czech Technical University	“Development and application of a knowledge database for engine concept modeling”
11:30	Alessio Moroncini, Dr. L. Cremers, BMW, DE; Dr. M. Kroiss, IABG	“NVH structural optimization using beams and shells FE concept models in the early car development phase at BMW”
11:50	KEYNOTE: Dr. Frédéric Ravet, Head of Combustion Research Unit, Automotive Advanced Technology Division, Renault	“Flame description in internal combustion engines. Application to spark ignition and compression ignition engine”
12:35	Lunch	

Wednesday, Oct 27th, Afternoon

13:30	TUTORIAL 1: Anton Haumer, EDT, AIT Mobility Department	"Introduction to concept modeling with Modelica"
15:40	Coffee Break	
16:00	TUTORIAL 2: Dr. Dragan Simic, Thomas Bäuml, EDT, AIT Mobility Department	"Modeling of electric and hybrid electric vehicles with Modelica"
19:30	Informal Dinner	

Thursday, Oct 28th, Morning

8:30	Reception desk open	
9:00	KEYNOTE: Dr. Carlo Beatrice, Istituto Motori	"The use of the detailed kinetic chemistry in the 3D CFD simulation of engine combustion"
9:25	Ozan Avarisli, Department of Mechanics, Politecnico di Torino	"HIL test bench - Characterization of passive braking system"
9:50	Nickil Srivatsan, IDMEC, University of Porto	"Application of enhanced assumed strain in structural dynamics: a preliminary study"
10:15	Matyas Schejbal, LAT, Aristotle University of Thessaloniki	"Various contributions towards on modeling of diesel after-treatment converters"
10:40	Coffee Break	
11:00	KEYNOTE: Dr. Domenico Caridi, Principal CFD Engineer Aerospace and Automotive Technical Services, ANSYS	"Advanced CFD simulation techniques for automotive fluid dynamic applications"
11:45	Neda Djordjevic, Polytechnic University of Valencia	"A tool for multidimensional calculation of muffler acoustic response"
12:10	Michele De Gennaro, EDT, AIT Mobility Department	"Characterization of acoustic properties for HVAC components: system reduction and 1D-modelling"
12:35	Lunch	

ABOUT VECOM

The aim of the VECOM training network is to provide dedicated research training in the emerging field of vehicle concept modelling for up-front pre-CAD functional performance engineering, bridging between industry and academia across Europe. The research area is of highly strategic importance to European automotive OEMs, who must launch products on an ever shorter time frame, at increased quality of multiple performance attributes. When simulation results become available in an early design stage, problems can already be solved before the first detailed CAD model is created, which will increase the quality of the first detailed simulation models and reduce the time to market. Moreover, early what-if studies can be performed to balance and optimize possibly conflicting performance attributes (safety, NVH, dynamics, durability ...) at an increased feasibility and at reduced costs. Novel methods will be developed to address this industrial need for a novel engineering process in which analysis leads the design. Applications will be worked out across partners and application fields, fully embedded in the vehicle industry context. Apart from benefits to researchers, partners and supervisors (OEMs), the proposed project will strengthen the competitive position of the European vehicle industry in the increasingly global market.

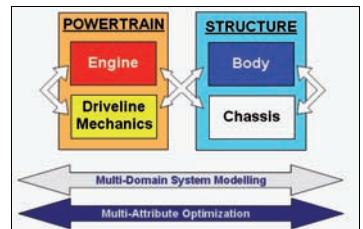
TRAINING PROGRAM

The VECOM field of training outlined in the figure shows the multi-disciplinary, multi-attribute scope of the Training Program. First of all, the vehicle industry requirements are assessed and a representative industrial design process is established (including application data) that can be used for benchmarking and validation of novel and improved methodologies throughout the consortium. The in-depth technical work program is then organized along the two core constituent parts of the vehicle (each with two R&D Areas), with focus on selected performance attributes:

- | Powertrain (Engine and Driveline): fuel economy, energy & emission management, drivability, intelligent control, durability and NVH
- | Structure (Body and Chassis): strength, NVH, safety, vehicle dynamics, durability

Two horizontal integration activities have been defined to exchange data / enable multi-attribute balancing:

- | Multi-domain system modeling (from 1D to detailed 3D), to incorporate all available knowledge and data at each design stage
- | Multi-disciplinary balancing and optimization: balance possibly conflicting performance attributes in an earlier stage (which is more easily achieved & results in better overall product performance)



The Training Program has a dual focus: in-depth methodology R&D (using predecessor information in case of a design variant, development from scratch for entirely new concepts ...), as well as multi-attribute application and collaboration across Areas and Partners. Dedicated short-term secondments will be organized to promote the researcher mobility and facilitate the exchange of information. The Training Program will be defined from an industrial perspective, to embed the researchers and their activity in an industrial context. By taking part in the training program, researchers will network across Europe, bridging industry and academia, which will fully prepare them for future career steps.