R&D Profile Form



Name of the	- Technische Hochschule Ingolstadt (THI) – Zentrum für
Organisations	Angewandte Forschung (ZAF) / Research Center
(existing	- AVL D GmbH – Niederlassung Ingolstadt
cooperation)	
Organisations Short	- THI
Names	- AVL
Organisation Types	- University of Applied Sciences
	 Company / Industry
Country	- Germany
	- Germany
Fields of Activity	Focus areas of the joint research activities of THI and AVL in the area
	of powertrain and internal combustion engines (ICE) are:
	- Analysis of powertrain components
	- Functional Analysis of powertrain
	 Simulation of internal combustion engines
	- Gas-exchange-calculation
	- Cylinder-pressure-indication
	- Engine control systems
	Ongoing R&D Activities of interest to topics listed below: Development of a 2-cylinder free piston internal combustion engine with lineargenerator (FPLG). This package is suitable for range- extender-applications in electric and/or hybrid vehicles. Current state: viable 2-cylinder engine (laboratory prototype) with linear piston translation and crank-slider-principle with engine control unit (ECU).
	Tasks for THI / AVL Cooperation: Building up a prototype engine with lineargenerator. Application of the ECU. Further research activities on the laboratory prototype to achieve less fuel consumption and lower exhaust gas emissons.





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Skills and Expertise	Doing research tasks at the FPI G-Project specified below:
Offered	Simulation of the internal combustion process with CT Dower
Offered	- Simulation of the internal combustion process with GT-Power
	Gas exchange simulation
	Calculation of thermodynamical characteristics
	- Creating a real-time-ECU using:
	Matlab/Simulink
	National Instruments components
	dSpace components
	 Validation of the simulation results by using test benches and
	measurement equipment
	Cylinder pressure indication
	Cylinder Pressure analysis
	Emissions measurement
Keywords	Internal Combustion Engine (ICE), Engine Control Unit (ECU), Engine
	Simulation, Emissions, Hybrid Powertrain, Serial Hybrid, Range
	Extender, Efficency, Combustion Analysis, Linear Generator, Gas
	exchange, Thermodynamics, Real-time-motormanagement
Previous FP Projects	
Participated	
Topic(s) of Interest	GV.4-2014 Hybrid light and heavy duty vehicles
from 2014-2015	GV.5-2014 Electric two-wheelers and new light vehicle concepts
Transport Work	
Programme	
Contact Person	THI: Prof. DrIng. Karl Huber
	AVL: David Müller
Position in the	THI: Head of laboratory – internal combustion engines and
Organisation	automotive technology
	AVL: Team leader – calibration gasoline and function development
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