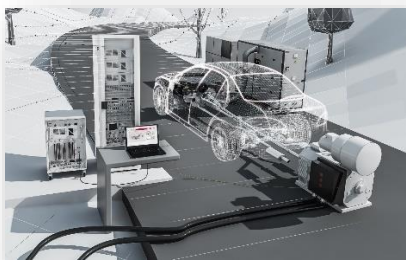


At the Institute for Combustion Engines (VKA) under the direction of Prof. Dr.-Ing. (USA) Stefan Pischinger, research on all topics concerning the vehicle powertrain is conducted.

Core focus is still the research on conventional combustion engine development like the implementation of innovative engine designs, fundamental research on more efficient combustion processes also in combination with alternative fuels or the improvement of the engine mechanics and aftertreatment systems. Additional research areas include virtual engine development, hybrid powertrains, electromobility as well as fuel cells and mechatronics for combustion engines. At any time, research is closely associated with the ongoing development of intelligent methods for test procedures and engine calibration.



## Bachelor Thesis / Master Thesis

### Start: from now

- Faculty 1 - Mathematics, Computer Science and Natural Sciences
- Faculty 4 - Mechanical Engineering
- Faculty 6 - Electrical Engineering and Information Technology

### AI-driven simulation in X-in-the-Loop environment for powertrain applications

Calibration and testing of powertrain components using virtualized X-in-the-Loop (XiL) approaches allow a significant reduction of efforts in comparison to classical, manual approaches. Machine learning is starting to be applied to a wide range of automotive control problems to overcome human-driven inaccuracies, and resulting in sub-optimal solutions. In this study, the potential of reinforcement learning for powertrain modeling and control is investigated. The framework is developed and tested to carry out the following research tasks:

- Set up of multi-domain powertrain environment based on reinforcement learning
- Validation of algorithm performance using measurement data
- Validation of real-time capability of AI-based controllers with real hardware

### Your profile:

- Interest in working for automotive applications
- Knowledge in MATLAB/Simulink
- First experiences in data science and simulation

### Would you like to know more?

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