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.

Development of E-Fuel Combustion Controller

To achieve the CO₂ targets in coming future, E-Fuels' – synthetic fuels produced from renewable electricity and CO₂ have been identified as promising solution. However, the fuel production steps may differ due to the locally different carbon sources and the fluctuating supply of regenerative electricity, resulting in variations of the fuel composition. These variations are challenging, since they can lead to significant deviations of the combustion behavior which typically cannot be taken into account during the engine calibration process.

Therefore, VKA in cooperation with FEV has developed a control approach (E-fuel Controller) to maintain a desired combustion trace for diesel fuel as well as for all possible fuel derivatives. This control concept needs further investigation to implement a robust control logic and develop advanced level combustion control functionalities.

Your tasks / your profile:

- Good knowledge in area of Combustion and Control theory
- Good knowledge in Matlab/Simulink, Uniplot, MS Office.
- Knowledge with Calibration on test bench/vehicle preferred

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

Would you like to know more?

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