The Teaching and Research Area for Mechatronics in Mobile Propulsion is located between the domains of mechanical and electrical drive components as well as control algorithms. Under the guidance of Professor Jakob Andert, the institute researches innovative, environmentally friendly vehicle drives and particularly emphasizes electrification and simulation-based development methods.

The automotive sector is currently undergoing a major transformation that is in particular affecting the drive technology. Electrification is gaining enormous relevance as one of the key technologies to reduce or avoid emissions. Regardless of the specific technology, a steadily increasing complexity of both the hardware and the associated control algorithms is leading to the evolution of modern drives towards software-intensive, embedded mechatronic systems.

**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

**Methanol synthesis process simulation**

**Motivation:**
On the path to a climate-neutral, fossil independent transportation sector, green fuels can play a significant role. Besides hydrogen, methanol can provide a good alternative due to its easy storage capabilities and fuel properties. Especially methanol synthesis as a part of a power-to-methanol process with hydrogen from an electrolyser and concentrated CO2 captured from industry processes, is a promising approach is to use excess electrical power from renewable energy sources to produce alternative fuels.

**Tasks:**
1. Building a simulation model: Based on an existing power-to-methanol simulation model with a simplistic blackbox model of the methanol synthesis, a new detailed simulation model will be developed
2. Integration into the current power-to-methanol model
3. Evaluation and interpretation of initial simulation results

Would you like to know more?

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