



Paderborn University is a high-performance and internationally oriented university with approximately 20,000 students. Within interdisciplinary teams, we undertake forward-looking research, design innovative teaching concepts and actively transfer knowledge into society. As an important research and cooperation partner, the university also shapes regional development strategies. We offer our more than 2,600 employees in research, teaching, technology and administration a lively, family-friendly, equal opportunity environment, a lean management structure and diverse opportunities.

Join us to invent the future!

In the **Faculty of Computer Science, Electrical Engineering and Mathematics** at the **Department of Automated Control** there is a vacancy for the position of a

**Scientific Co-Worker (f/m/d)
for Hybrid Models of Dynamic Systems Using Machine Learning and
Expert Engineering Knowledge**

(Salary Level E 13 TV-L)

with 100% of the regular working hours starting earliest from 2022-09-01. The position is initially limited until 2025-08-31 due to third-party funding in accordance with the federal state Science Employment Law (WissZeitVG). The contract period corresponds to the approved project funding. The possibility of a doctorate or post-doc qualification is given.

Project description and responsibilities:

- Research on hybrid (state-space) modelling of dynamic systems using both data-driven machine learning techniques as well as expert-based a priori knowledge
- Research on optimal system excitation patterns in order to retrieve information-rich data sets in a short amount of time while satisfying system constraints (model-free and model-based exploration strategies facing uncertainty)
- Transfer of simulation-based pre-investigations to real-world experiments using embedded control hardware together with IoT edge computing platforms
- Testing of the proposed methods using real-world electrical power conversion systems (e.g., power electronics and drives) and mechatronic systems (e.g., inverted pendulum, drones) in the laboratory
- Scientific exchange and active cooperation with related research groups
- Contributing to open-source software repositories addressing the above topics
- Writing scientific papers for journals and conferences

Your qualifications:

- Very good university degree (master, Ph.D. or similar) in the field of control engineering, electrical engineering, mechatronics, computer science or similar
- Profound knowledge of optimal control of dynamic systems using model-based and/or model-free approaches (model predictive control, reinforcement learning,...)
- Profound knowledge of dynamic system models derived from first principles and/or from empirical data sets (machine learning, system identification)
- Profound knowledge of software-related engineering tools and programming languages (e.g., Python, Julia, Matlab/Simulink, dSPACE, VHDL, C/C++,...)
- Desirable: practical experience in working at laboratory test benches for embedded systems (using microprocessors, FPGAs or rapid-control-prototyping hardware)
- Independent and team-oriented approach to work
- Very good command of written and spoken English or German

