

PhD Student / Research Assistant / Postdoctoral Researcher (f/m/d) in the Field of Property-Controlled Forming Processes

Job Description:

The [Digital Process Engineering \(DPE\) Group](#) of the Institute of Mechanical Process Engineering and Mechanics of the Karlsruhe Institute of Technology (KIT) focuses on the development and application of combined model- and data-based methods and concepts for control, automation, and optimization of complex dynamic processes, systems and plants. This also includes interfaces to robotics and autonomous systems and their integration into highly automated process chains. An essential aspect thereby is the interconnection of dynamic subsystems to form systems with desired properties and behavior. This results in links to a wide range of applications in areas such as process engineering and production technology, life science engineering, health technologies, energy technology, the circular economy, and land- and sea-based mobility.

The DPE group is seeking at the earliest possible date for a highly qualified and motivated PhD student, research assistant or postdoctoral researcher to work on model-based estimation and control design for multi-stage sheet metal forming processes. This involves modeling using the finite element method, the analysis and the model order reduction of large-scale systems, and estimator and controller design based on reduced order models of complex dynamical processes. The research activities include the implementation of the control concept at a real plant.

The position and the research activities are embedded in the Priority Program SPP 2183 "Property-controlled metal forming processes" funded by the Deutsche Forschungsgemeinschaft (DFG). Willingness to work in an interdisciplinary team with specialists from metal forming and manufacturing is mandatory.

Personal Qualifications:

You should provide

- a master degree in Mechanical Engineering, Electrical Engineering, Process Systems Engineering, Technical Cybernetics or a related discipline with a major in control theory or control systems engineering focusing on nonlinear and/or distributed parameter systems;
- profound knowledge in mathematical modeling of complex dynamical systems as well as data-based reduced order modeling, modern control techniques (optimal, model predictive, nonlinear), and their numerical analysis and evaluation. Experience in the practical implementation of model predictive controllers or moving horizon estimators on embedded devices or industrial PCs is beneficial;
- ability to work and to communicate in a team;

- excellent command of the English language in spoken and written form is required. Commandment of the German language in spoken and written form is beneficial.

Salary:	Salary category 13 TV-L, depending on the fulfillment of professional and personal requirements.
Organisational Unit:	Institute for Mechanical Process Engineering and Mechanics (MVM)
Contract Duration:	limited to 2 years, an extension is possible in principle
Entry Date:	as early as possible
Application Deadline:	23.02.2024
Application Documents	one-page cover letter, curriculum vitae, diplomas and transcripts, names and contact information for at least two professional references
Contact Person for Topic-Related Questions:	Prof. Dr.-Ing. habil. Thomas Meurer Email: thomas.meurer@kit.edu .

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