The Automation and Control Institute (ACIN) at TU Wien is offering the following

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PhD-Position (m/f/d) in Industrial Robotics:

Learning and Execution of Industrial Processes on 3-D Freeform Surfaces

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The project

Join the team of the **Festo System Lab for Autonomous Handling Systems** (https://www.acin.tuwien.ac.at/en/festo-systemlabor-fuer-autonome-handhabungssysteme/) in the Complex Dynamical Systems Group (**Prof. Andreas Kugi**). In this project, an autonomous robotic system learns surface-based processes from human demonstrations, understand the most important process parameters and be able to autonomously apply them to new, previously unseen workpieces. Novel methods for planning and execution of surface-based processes have been developed and published, see [1], [2] and [3].

Choose your research topic

- **Learning of surface-based processes from human demonstration using instrumented tools**: Model-based and data-driven learning of industrial processes using object geometry and multi-channel sensory information.
- **Execution of surface-based processes with high temporal and spatial accuracy**: Hybrid model-based and data-driven methods are employed to improve the static and dynamic path accuracy relative to a known 3-D freeform surface. Trajectories are planned using a trajectory database, which is generated using a laser tracker.

Your profile

- Master's degree in mathematics, automatic control, computer science, mechatronics, robotics, electrical engineering or mechanical engineering
- Excellent technical understanding and analytical capabilities
- High commitment and motivation, willingness to contribute to academic teaching
- Team spirit, strong communication skills, goal orientation, structured, and responsible way of working
- Very good command of written and spoken English, basic skills in German favorable

We offer

- Future-oriented research and innovative solutions for the latest problems
- Scientific freedom and time to author a PhD dissertation
- Solid training and continuing education as well as participation in international conferences
- Promotion, support, dialog, and cooperation in a motivated and interdisciplinary team
- Cooperation with a renowned, internationally active, industrial research partners
- Secured funding and well-equipped infrastructure, see https://www.acin.tuwien.ac.at/en/industrial-robotics/
- Employment contract for 3 years (40 hours a week) with option for extension
- Gross salary of € 45.882,20 p.a.

We are looking forward to receiving your application including the usual documents via e-mail sent to Dr.techn. Christian Hartl-Nesic, hartl@acin.tuwien.ac.at.

[1] C. Hartl-Nesic, T. Glück, and A. Kugi, Surface-Based Path Following Control: Application of Curved Tapes on 3-D Objects, IEEE Transactions on Robotics, vol. 37, iss. 2, p. 615–626, 2021.

[2] T. Weingartshofer, B. Bischof, M. Meiringer, C. Hartl-Nesic, and A. Kugi, Optimization-based path planning framework for industrial manufacturing processes with complex continuous paths, Robotics and Computer-Integrated Manufacturing, vol. 82, p. 102516, 2023.

[3] M. N. Vu, F. and Beck, M. Schwegel, C. Hartl-Nesic, A. Nguyen, and A. Kugi, Machine learning-based framework for optimally solving the analytical inverse kinematics for redundant manipulators, Mechatronics, vol. 91, p. 102970, 2023.

About us

The Automation and Control Institute (ACIN) belongs to the Faculty of Electrical Engineering and Information Technology of TU Wien. At ACIN, more than 80 researchers conduct basic research, solve challenging practical problems, cooperate with industrial research partners, develop innovations, and offer students excellent academic teaching in the fields systems theory, automation, and control engineering. More info at https://www.acin.tuwien.ac.at/komplexe-dynamische-systeme-cds/.