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

PhD-Position (m/f/d) in Industrial Robotics: Learning and Execution of Textile Handling in Circular Economy

The Project

Join the team of the Complex Dynamical Systems Group (Prof. Andreas Kugi) at TU Wien in Vienna, Austria! This FFG-funded project deals with increasing the reuse of textiles by improving the collecting and sorting processes involved in the circular economy. The project is developing a **new collection and sorting process for the production of second-hand clothing**, which is intended to radically simplify collection and sorting processes and make sorting steps at least partially obsolete. It proposes a comprehensive, holistic, cross-system model for this.

This project builds upon existing high-profile works and infrastructure, see [1], [2], and [3].

The Goal

In textile sorting, the separation, rough sorting, and flattening of garments are of the utmost importance. This PhD thesis aims to develop the flattening process for industrial scale. Using novel instrumented tools, demonstrations of this process by humans are precisely recorded. Haptic aspects can be recorded with integrated force/torque sensors, and the actual gripping points on the textile can be recorded with integrated cameras. A very general data set is thus generated by human experts, making it possible to create and learn from movements, interaction forces, and gripping points for various garments, materials, print patterns, and sizes.

Your Profile

- Master's degree in mathematics, automatic control, computer science, mechatronics, robotics, electrical engineering or mechanical engineering
- Excellent technical understanding and analytical capabilities
- Background in machine learning advantageous
- 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 € 52.007,20 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] C. Unger, C. Hartl-Nesic, M. N. Vu, and A. Kugi, ProSIP: Probabilistic Surface Interaction Primitives for Learning of Robotic Cleaning of Edges, in Proceedings of the IEEE/RSJ IROS, 2024, p. 5956–5963; Best Application Paper Award.

[3] F. Beck, M.N. Vu, C. Hartl-Nesic, and A. Kugi, Model Predictive Trajectory Optimization With Dynamically Changing Waypoints for Serial Manipulators, IEEE Robotics and Automation Letters, vol. 9, iss. 7, p. 6488–6495, 2024.

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/.