

RaCPro – Robot-Assisted Composite PROduction

Development of a robot-assisted draping workstation for the production of components from fiber composite plastics (Coop. ITA)

Contact

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Type of Work: Project Work, BA/MA-Thesis or HiWi



Around 60% of companies that manufacture fiber-reinforced plastics (FRP) state that they use manual processes in their production. Small and medium-sized enterprises (SMEs) in particular benefit from the high proportion of manual work. SMEs can therefore operate highly flexibly and achieve a high component variance with small quantities. A fully automated system cannot achieve this type of performance. However, manual processes require a great deal of expert knowledge and experience. However, there is a growing shortage of skilled workers in the industry due to poor recruitment of young talent.

The aim of this research project is therefore to relieve the burden on skilled workers through the use of robots and to increase production capacities by means of technical support. Skilled workers take on tasks with a high degree of complexity in order to utilize their pronounced material awareness and cognitive flexibility, while robots learn and take over less complex, repetitive draping tasks from experts without tiring. By means of learning from demonstration, draping movements are to be demonstrated directly on the robot and generalized by it.

Possible tasks/topic directions:

- Further development of our demonstrator
- Further development of a GUI in PyQt
- Carrying out evaluation tests

Requirements:

- Studies in mechanical engineering, electrical engineering, industrial engineering, CES, or similar disciplines
- High motivation and enthusiasm for topics related to data analysis and control engineering, as well as working with a real process
- Independent, reliable working habit

We offer:

- Interesting work in an innovative field
- Participation in shaping the project, work focuses, and contribution of own ideas
- Close, regular supervision in German or English
- Working on a real plant at the ITA (Institute for Textile Technology)
- Excellent working atmosphere in a highly motivated team in an exceptional backyard location with an office dog