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The German Aerospace Center DLR has a dual mandate as the national research center for aeronautics and space, and as the space agency of the German federal government. Approximately 8,000 people work for DLR on a uniquely diverse range of topics spanning the fields of aeronautics, space, energy, transport, and security research. They collaborate on projects extending from fundamental research to the development of the innovative applications and products of the future. If the idea of joining a top-class team of researchers working in a supportive, inspirational environment appeals to you, then why not launch your mission with us?

For our institute of **Robotics and Mechatronics** in **Oberpfaffenhofen**, we wish to recruit a qualified graduate student to work for his/her

Master's Thesis on the Optimization of Algorithms for Stable Shared Control of Robots

Your mission:

Autonomous robots use various sensors to perceive their environment to implement the tasks assigned to them. On the other hand, in teleoperation, a human operator commands a distant robot to implement the task by getting visual and haptic feedback. Since each of these control approaches has its merits and drawbacks, they are combined with certain task allocation factors (weights), and this approach is called Shared Control.

The goal of this thesis work is to improve and find novel algorithms for shared control with task allocation factors between multiple autonomous controllers and teleoperation to optimize the performance of the robot.

Your main tasks:

- Familiarize yourself with the algorithms developed at DLR for stable shared control
- Perform a literature survey
- Optimize an algorithm for sharing task allocation factors while ensuring stability
- Validate the algorithm with simulations and real hardware experiments

Your qualifications:

- Master student in robotics and control engineering
- Good knowledge in Matlab Simulink, C++, git
- Previous hands-on experience with cobots is beneficial
- Independent and reliable work attitude

Your contact:

Thomas.Hulin@dlr.de, Maximilian.Muehlbauer@dlr.de

