Project on control of MIMO systems

- Development of MIMO control tasks for advanced teaching with the Quanser AERO -

Job description

With its individually controllable propellers that are mounted in such a way that the system offers 2 degrees of freedom (DOF), the Aero provides the perfect platform for the illustration of control concepts for multi-input multi-output (MIMO) systems. The project aims for the specification and solution of control tasks that allow to illustrate and challenge advanced control schemes such as model predictive control (MPC). Due to the different configurations of the propellers (see Fig. 1), possible tasks are manifold and may include:

- angular position or velocity control (for pitch or/and yaw angle)
- attitude control
- trajectory tracking
- system identification.

Your own suggestions and ideas for a possible application of the Aero in advanced teaching are, of course, also welcome.

Your profile

Ideally but not necessary you already have some experience with

- control theory (state space representation, feedback control, ...)
- system identification
- Matlab and Simulink

Interested?

If this project has aroused your interest or you have further questions about the topic, please do not hesitate to contact us via dieter.teichrib@tu.dortmund.de.

Figure 1: Different configurations of the propellers allowing for different control tasks (Source: Quanser).