Simulation environment for UAV-based monitoring systems of heliostat fields

Master student in robotics, computer science, engineering or natural science (f/m/x)

Your mission:

You are passionate about the application of robotics in renewable energies? You would like to live in the sunny city of Almería, Spain while contributing to a successful energy transition at DLR’s Institute of Solar Research, one of the world’s leading institutions in the field of solar technology? Then join our team!

In central receiver concentrating solar power (CSP) plants, several thousand mirrors (so-called heliostats) focus solar radiation onto a receiver mounted on a central tower. The efficiency of central receiver CSP plants is negatively affected by falsely aligned and damaged heliostats. Hence, the condition of the power plant has to be monitored in order to ensure cost efficient operation. At our institute, we develop systems to monitor CSP plants using unmanned aerial vehicles (UAVs). Currently, flight routes for these UAVs are planned prior to their flight, while measurement data is evaluated after the flight. We are currently working on performing the image data analysis in real-time, enabling the dynamic planning of the UAV flight route and opening up new possibilities for automated monitoring.

During your thesis or your internship, you will support us in developing and evaluating a simulation environment, in which we will test the communication with the drone as well as algorithms for image data analysis and dynamic flight route planning. Depending on your interests and experience, you can focus on different aspects of this simulation environment. Your tasks will include literature research as well as software development and evaluation.

You will be closely integrated into our diverse and highly motivated team in the ‘Qualification group’ located in Almería, Spain. An experienced colleague will closely work together with you and support you throughout the entire internship or thesis. In the case of a thesis project, the tasks will be aligned with the responsible professor of your university.

Your qualifications:

- You are studying for a master degree with a scientific background and show very good study results
- You have good English language skills in speaking and writing, as you will study scientific literature and communicate with institute members
- You are proficient in a programming language (Python, MATLAB or C++), preferably in the context of robotics or a related field
- Depending on your interests, experience in MAVLink, ROS, Blender, Unreal Engine or Computer Vision is beneficial
- You are used to work in a structured and independent way and are able to communicate your questions and results
- German and/or Spanish language skills are beneficial (not required)

Your benefits:

Look forward to a fulfilling job with an employer who appreciates your commitment and supports your personal and professional development. Our unique infrastructure offers you a working environment in which you have unparalleled scope to develop your creative ideas and accomplish your professional objectives. Our human resources policy places great value on a healthy family and work-life-balance as well as equal opportunities for persons of all genders (f/m/x). Individuals with disabilities will be given preferential consideration in the event their qualifications are equivalent to those of other candidates.