

“Concept Development of a Modular Test Rig for Tools of Underwater Robots (ROVs/AUVs/Crawlers)”

Background

Underwater robots (ROVs, AUVs, crawlers) are increasingly performing complex tasks in offshore wind energy, marine research, inspection, and underwater maintenance. For these operations, a wide range of tools and end-effectors are used – from grippers and cutting tools to specialized inspection and manipulation devices.

To ensure reliable tool performance, a realistic and reproducible testing environment is essential. A modular test rig should allow different tools to be tested efficiently, evaluate their performance, and accelerate further development.

Objective of thesis

The objective of this thesis is the conceptual development of a flexible, interchangeable test rig system that meets the mechanical, hydrodynamic, and measurement requirements for testing underwater robot tools. This includes analyzing typical tool types, defining relevant load and environmental conditions, and developing a design concept adaptable to different test objects.

Tasks

Depending on the type of thesis (Bachelor, Project, Master), individual focus areas may vary. The thesis can be written in German or English. Core tasks include:

- Analysis of typical tool classes for ROVs, AUVs, and crawlers
- Derivation of relevant operational and load conditions
- Definition of testing and measurement requirements
- Conceptual design of an interchangeable, scalable mechanical setup
- Integration of sensors and measurement technology
- Optional: Prototyping or simulation

Your Profile

- Studies in Mechanical Engineering, Mechatronics, Robotics, Marine Technology, or a related field
- Independent and structured working style
- Experience in CAD design or instrumentation

We offer

- Work on a future-oriented topic in the field of marine robotics
- Close supervision by experts from research and industry
- Creative technical work in an exciting research environment
- Access to testing facilities and technical resources

Contact

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