“Development of an Adaptable Underwater Robot Chassis”

Background

Underwater chassis form the foundation for mobile underwater robots such as ROVs, AUVs, or crawlers. Different operational environments – from uneven seabeds and offshore infrastructure to research areas – place high demands on stability, traction, and adaptability. An adaptable chassis allows flexible adjustment to various substrates and flow conditions, improving maneuverability and optimizing energy consumption.

Objective of thesis

The objective of this thesis is the conceptualization and development of a modular, adaptable underwater chassis that is robust, flexible, and usable for different robotic platforms. The work includes analyzing operational conditions, selecting suitable chassis mechanisms and materials, and developing an initial concept design.

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 underwater operational scenarios and seabed conditions
- Definition of requirements for stability, adaptability, and traction
- Investigation of suitable chassis concepts (wheels, tracks, legs, hybrid solutions)
- Selection of appropriate materials and drive systems for underwater operation
- Development of a conceptual design for a modular, adaptable chassis
- Evaluation of mobility, energy efficiency, and robustness
- Optional: CAD modeling or simulation of functional workflows; feasibility assessment including opportunities, risks, and limitations

Your Profile

- Studies in Mechanical Engineering, Mechatronics, Robotics, Marine Technology, or related fields
- Independent and structured working style
- Experience with CAD, fluid systems, or robotics design is advantageous

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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