“Development of a Multi-Use Biofouling Sampler”

Background

Biofouling – the colonization of surfaces by micro- and macro-organisms – poses a significant challenge for both maritime infrastructure and underwater robotics. For research and monitoring, it is necessary to collect samples in a targeted and reproducible manner to study biodiversity, growth rates, and ecological impacts. Existing systems are often limited to single samples or are difficult to use repeatedly. A multi-use biofouling sampler would enable efficient, standardized sample collection under controlled conditions.

Objective of thesis

The objective of this thesis is the conceptualization and development of a multi-use biofouling sampler that allows repeated and safe sample collection underwater. The work includes analyzing biological and technical requirements, selecting suitable mechanisms and materials, and developing an initial system 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 biological requirements for biofouling samples (size, colonization density, fragility)
- Review of existing sampling systems and identification of potential improvements
- Development of mechanical concepts for repeatable sample collection
- Selection of suitable materials for underwater operation and biological compatibility
- Design of a conceptual system including handling and storage of multiple samples
- Optional: CAD modeling or simulation of functional workflows; assessment of feasibility, robustness, and repeatability

Your Profile

- Studies in Mechanical Engineering, Mechatronics, Marine Technology, Biotechnology, or related fields
- Independent and structured working style
- Knowledge in CAD, fluid systems, or experimental biology 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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