Job posting

**Type of position**
- ☒ scientific
- ☐ administrative

**Target group**
- ☒ graduates
- ☒ post docs
- ☐ other

**Title**
Investigation of advanced energy converters through energy management optimization and hardware-in-the-loop testing

**Institution**
The DLR Institute for Maritime Energy Systems researches and develops innovative solutions for the defossilization of-, emissions reduction from-, and enabling increased usage of renewable energy in, waterborne transport. In cooperation with the maritime industry, the developed solutions are transferred into practice. The institute is building large-scale testing infrastructure consisting of an onshore laboratory and a research vessel to test and develop modular energy and ship concepts. This will create an unprecedented range of testing capabilities, efficiently enable method and concept validation through data analysis, and ensure the reliability of the solutions.

**Position**
Research Scientist, with the possibility to pursue doctoral or postdoctoral research opportunities
- Full-time position, part-time possible
- Originally limited to 3 years
- Remuneration up to TVöD 14, depending on qualification

**Responsibilities**
Advanced energy converters such as fuel cells (PEM fuel cells, SOFCs) show significant promise in decarbonizing waterborne transport, and future maritime energy systems could use these energy converters within various novel hybrid system architectures. Fuel cell operation needs to be evaluated, validated, and optimized under realistic dynamic test conditions to closely emulate the hybrid maritime energy system operation. To realize this goal, we aim to develop a hardware-in-the-loop test environment to test the energy converter, energy management controller, and other laboratory thermal and electrical systems interacting in real-time with a simulation of the ship.

Your responsibilities will include:
- Research of fuel cell operation of ships (including cruise ships)
- Selection of appropriate research methods and tools
- Literature review to identify state-of-the-art and identification of new research topic
- Posing appropriate hypotheses
- Planning and determination of methods to test the hypotheses
- Planning and execution of experiments, and data collection
- Create a hardware-in-the-loop test environment for fuel cell research
- Conduct tests on novel energy converters and on energy management controllers in the created test environment
- Analyzation and evaluation of the conducted experiments in the developed test environment
- Validation of the conducted tests
- Optimization of the fuel cell operation according to the test results
- Make statements about the confirmation of the established hypotheses
- Carry out the classification of the evaluation results in science
- Data collection and evaluation to draw conclusions from experiments
- Publication and dissemination of research results internally and externally
- Completion and monitoring of assigned budget plans for project budget compliance
- Proposal of new tasks and research topics for the strategic development of the research area, department, and institute
- Generation of new IP and filing of patents
- Acquisition of third-party funding, and potential take-over of the project management activities in coordination with the department leader
- Supervision and guidance of undergraduate and graduate students

**Requirements**

- Completed Master’s degree in mechatronics, control engineering, electrical engineering, mechanical engineering, power engineering or a similar course of study relevant to the job
- Experience in the development and implementation of control software for experimental testing
- Experience in planning and test execution of HiL test environments
- Knowledge of optimization of power systems
- Extensive English language skills
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<th><strong>Application procedure (deadline etc.)</strong></th>
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<td>- Expected start at the earliest opportunity</td>
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<td>- Please apply directly at the job advertisement:</td>
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<tr>
<td>Dr. Dheeraj Gosala - <a href="mailto:dheeraj.gosala@dlr.de">dheeraj.gosala@dlr.de</a></td>
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