



Wave Energy Converter – verification and optimization of a new invention.

Type of project: BSc or MSc

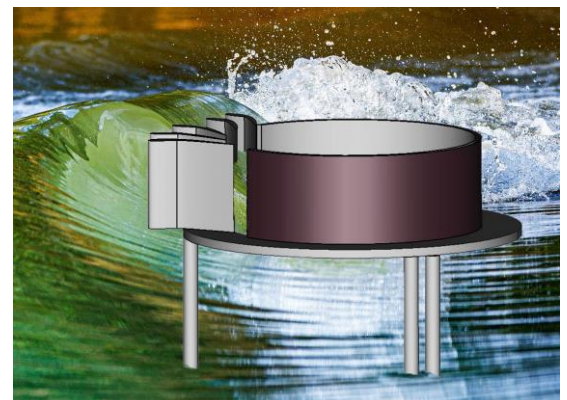
Project description:

A new type of WEC needs verification and optimization. The basic functionality is based on a new approach, which might be world-wide unique, but is founded on well-known concepts and components. The invention has been analyzed by Aerotak A/S, and will manage to convert wave energy to electrical energy. This project is supposed to verify functionality, and to improve efficiency. There is room for creative and inventive thinking!! There are elements where existing technology is used, while others are new, and will require hydrodynamic analysis to be able to fully understand and optimize the behavior. The best way to approach the unusual aspects of this concept is to build a simplified 3D scale model and test it DTU's hydrodynamics lab. Afterwards, there is room for adjustments in vital parts of the invention, and for possible increase in its efficiency level. Wave energy converters in general suffer from a long history of trial and error – not trial and success. This invention would work very well together with an already existing off-shore windmill park (a substantial bonus!), and if the efficiency level is acceptable, the simple remaining question is the amount of produced power/euro – power production versus cost. With a concept based on already existing technology, this aspect could prove interesting, if and when a full-scale prototype is built and tested at a later stage.

There are many and varied challenges in this project due to its complexity; CAD skills, advanced computer simulations, mathematical models, a physical model and similar, and at last but not least – room for creative thinking!

Depending on the background and interests of the student, possible projects could include one or more of the following topics:

- Use CAD software to draw a 3D computer model, and build a real-world functional 3D scale model based on the computer drawings. Test this model in the lab.
- Make computer simulations of the device in incoming waves, and optimize the fixed and rotating parts.
- Compare the calculations with measurements and scale them up to full-scale.



Contact persons

Harry B. Bingham
DTU Construct
hbbi@dtu.dk

Lennart Jarde
PersonalTechnology
ceo@personaltechnology.dk