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Aiding Design of Wave Energy Converters via Computational Simulations[1] HEJAR JEBELI AQDAM, PhD Student, University of Massachusetts Dartmouth, BABAK AHMADI, MS Student, University of Massachusetts Dartmouth, MEHDI RAESSI, MAZDAK TOOTKABONI, Assistant Professor, University of Massachusetts Dartmouth — With the increasing interest in renewable energy sources, wave energy converters will continue to gain attention as a viable alternative to current electricity production methods. It is therefore crucial to develop computational tools for the design and analysis of wave energy converters. A successful design requires balance between the design performance and cost. Here an analytical solution is used for the approximate analysis of interactions between a flap-type wave energy converter (WEC) and waves. The method is verified using other flow solvers and experimental test cases. Then the model is used in conjunction with a powerful heuristic optimization engine, Charged System Search (CSS) to explore the WEC design space. CSS is inspired by charged particles behavior. It searches the design space by considering candidate answers as charged particles and moving them based on the Coulomb's laws of electrostatics and Newton's laws of motion to find the global optimum. Finally the impacts of changes in different design parameters on the power takeout of the superior WEC designs are investigated.

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