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Category: Waterborne

Research Area 8: Planning, Modelling and System Design

Country: United Kingdom

Idea Number: 102

I-SHIP: an intelligent interactive design system for greener and customer-centered ship design

The maritime industry is structured on one of the world's most complex engineering systems such as container ships, tankers, super-yachts and cruise ships. Design of these systems is a critical task and improving their efficiency is crucial as it not only impacts the world's economy but also reduces the carbon footprint of this industry. Due to the complexity and massive physical form of these systems, engineers heavily rely on the computational design platforms as building the full-scale prototypes in time-consuming and uneconomical. Usually, computer-aided design systems are used to build and test their performance. However, the non-intuitive nature of these systems hinders the designers in creating optimal designs. We aim to develop a new intelligent interactive design system for the rapid creation of optimal and user-centered designs. The new system will involve generative and interactive design approaches, which will enable designers to interactively induce their preference for designs into the design space exploration and to create a variety of optimal and user-centered of design alternatives. Among them, a user will select a preliminary design with desirable characteristics based on its physical appearance and performance. Lastly, when building products it is essential to incorporate the customer psychological preferences. Therefore, along with the physical evaluation, an important element of shape exploration should be the integration of visual perception of the users. To achieve this, the users' stylistic perception will be interactively integrated with performance metric during the design exploration.





## Key Characteristics

Interactive design system • User-centered design