

Naval architecture and hull design

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Abstract

Naval architecture is the study of ship design, focusing on overall balanced design considering the functional requirements, with special focus on the hull, including buoyancy; centers, moments, and stability; structural integrity; resistance and powering, etc. I examined the design of a small 1 m LOA hull intended for a model or autonomous sailing craft. To design the hull and obtain volumes and centers for stability calculations, I used Autodesk Fusion. To physically construct the hull, I used additive manufacturing (3D printing), using several hull sections in order to satisfy manufacturability constraints due to bed length of the tooling.

Index Terms

naval architecture, CAD, computer aided design, Fusion 360, hull design, stability, buoyancy, resistance and powering, sailboat, sailbot, autonomous sailbot, 3D printing, additive manufacturing