The Project
Achievements so far
The expectation
The Project

Improvement of safety and efficiency of planing crafts by developing an Intelligent Navigation Assistance (INA) System

Design & Production: UZMAR
Parametric Modelling & Optimization: FRIENDSHIP SYSTEMS
Model Tests: SVA POTSDAM
Mathematical Modelling & Simulations: TECHNICAL UNIVERSITY BERLIN
INA System: OES
Prototype testing: All parties
Achievements so far

BY UZMAR

- 3d model
- Basic stability calculations
- Basic power calculations
- Engine selection and placement
Achievements so far

BY OES

- The software and hardware concept development of the autonomous navigational aid (INA) system for planing and semi-planing boats has been completed, thus the system architecture has been finalized.

- INA system development and integration studies continue in accordance with this architecture.

- At the end of the project, we aim to commercialize the system by making the INA system developed for planing and semi-planing boats usable for other possible surface vessels as well.
Achievements so far

BY FSYS

- Fully parametric model with 20 free variables developed
- Roughly 5 seconds per design
- Model deployed as webapp
- Internal surfaces for numerical grid (GridPro) modelled as well
Achievements so far

BY FSYS

- Webapp deployed for partners
- Started with requirement list provided by UZMAR
- Hydrostatics implemented (righting lever curve including trim)
- Preliminary Savitsky algorithm implemented
Achievements so far

BY FSYS

- Close cooperation with GridPro to develop automated meshing for a large design space
- Evaluation of different meshing topologies e.g. B-wrap vs. O-grid
- Development of python routines for quality control
Achievements so far

BY BTU

Development of novel 3+3 DOF manoeuvring prediction procedure

- Objective: Pure RANS based manoeuvring prediction model for planing boats in 6 DOF taking into account large changes of running attitude during a manoeuvre

- Developed mathematical model for this purpose to be validated

- Suitable numerical setup for virtual captive tests successfully implemented

- Automatic determination of running attitude (given by trim, rise and heel) developed and successfully applied
Achievements so far

BY BTU

Development of novel experimental technique

- Objective: Measuring device for captive model tests with free/fixed heave, pitch and roll motions and softly guided/fixed surge, sway and yaw motions.

- Experimental setup for static test (with free rise, trim and heel) already developed

- Concept for measuring platform with slides for dynamic tests completed
Achievements so far

BY BTU

- First experimental campaign with basic design of planing craft in steady straight ahead and oblique motion starting in December
- Validation of predicted running attitude, resistance, required power and other simulation results
- Extensive virtual captive model tests with basic design until end of year
- First application of the novel manoeuvring prediction method will be published at ONR Symposium on Naval Hydrodynamics 2022
- Dynamic captive model tests with new measuring platform scheduled for 2022
Achievements so far

BY SVA POTSDAM

- SVA started building the model for the test
AUTOPLAN – CADMUSS

“CADMUSS - Collision Avoidance Domain-Method Used by Ships and aShore” project aims to develop a collision avoidance dynamic domain method and a mathematical model proper for ship-based and shore-based activities considering the ship dynamics in ship-to-ship encounters.

The model is predicted to be implemented into the collision avoiding system. Within this project, the safety of the passage in ship to ship encounters, the ability of the decision support tools and the reliability of the accidental risk assessment are aimed to be increased. The CADMUSS project outcomes are mainly focused on the safety concept like the AutoPlan project where the INA system is aimed to be capable of instability control with advanced equipment and software.

https://www.martera.eu/projects/2019/cadmuss
The Expectation

AUTOPLAN – FLEXIMAN

“FLEXIMAN - Flexible Additive Manufacturing for competitive Maritime Components” project aims to redesign the conventional manufacturing process in the maritime industry by implementing Additive Manufacturing which is offering to increase the functionality of the products, to reduce the manufacturing cost and time.

Within this project, flexible methods on Additive Manufacturing will be developed. At the end of the AUTOPLAN project, a prototype based on the optimized hull will be manufactured and equipped with rudders and propellers which are difficult to produce precisely.

Therefore, hull form, propellers and rudders can be manufactured with the Additive Manufacturing method within further studies.

https://www.martera.eu/projects/2019/fleximan
THANK YOU