

IMDC 2022 Program

Sunday, June 26

2:00 - 8:00 Registration and Badge Pick Up
Fort Camp Lounge, Gage Residence

Monday, June 27

8:00 - 2:00 Registration and Badge Pick Up
Fort Camp Lounge, Gage Residence

8:30 – 8:45 Opening Greetings
Chris McKesson, IMDC 2022 Conference Chair
Jon Mikkelsen Director, UBC Naval Architecture and Marine Engineering

8:45 – 9:00 Sponsoring Industry Remarks
Gary Michael, Director Functional Engineering, Seaspan Shipyards

9:00 - 10:00 **Keynote Address**
100 Things (or so) a Ship Designer Needs to Know
David Andrews, University College London

10:00 - 10:30 -Refreshment Break

10:30 - 12:00 - **Session 1 – Novel Design Concepts 1**
Session Chair: Per Olaf Brett
Session Co-chair: Chris McKesson

Wind propulsion: Operation with Hydrokinetic Turbine Energy Recovery
Chris Greenhough, University College London

The Hydrodynamics of Elogrid
Juha Tanttari, Elomatic

Technology Transfer in Novel Ship Design: A deep Seabed Mining Study
Astrid V. Solheim , Norwegian University for Science and Technology

Ontologies in the Marine Domain and Use Cases for Autonomous Vessel Design and
Other Novel Designs
Connor Arrigan, University of Michigan

12:00 - 1:30 Lunch

1:30 - 3:00 Session 2 – Propulsion and Machinery Systems Design

Session Chair: Hans Hopman

Session Co-chair: Jon Mikkelsen

Understanding Agility as a Parameter for Fuel-flexible Ships

Benjamin Lagemann, Norwegian University for Science and Technology

Comparison of Decarbonisation Solutions for Shipping: Hydrogen, Ammonia and Batteries

Haibin Wang, University of Strathclyde

An Evaluation of Suitable Methods to Deal with Deep Uncertainty Caused by the Energy Transition in Ship Design

Jesper Zwaginga, Technical University Delft

A Study on the Performance Improvement of Hi-Fin

Sooyeong Park, Hyundai Heavy Industries

3:00 - 3:30 Break

3:30 - 5:00 Session 3 – Design Methodology 1

Session Chair: Julie Chalfant

Session Co-chair: Abby Jorgenson

The Network Block Approach Applied to the Initial Design of Submarine Distributed Ship Service Systems

Muhammad Hary Mukti, University College London

System-of-systems Modelling and Simulation in Warship Design for Operations

Etienne Duchateau, Netherlands Ministry of Defense

Support Functionality in System Modelling: the Chicken or the Egg.

Koen Droste, Damen Naval Group

Quantifying Interfaces in General Arrangement Drawings

Henrique Gaspar, Norwegian University for Science and Technology

Tuesday June 28

8:00 - 12:00 Registration and Badge Pick Up
Fort Camp Lounge, Gage Residence

8:30 - 9:00 Plenary Session – Industry Sponsor Talks

Juha Asanti, Vice President, Marine
CADMATIC

9:00 – 10:00

DESIGN METHODOLOGY STATE-OF-THE-ART REPORT
Stein Ove Erikstad, Benjamin Lagemann
Norwegian University for Science and Technology (NTNU)

10:00 - 10:30 – Break

10:30 - 12:00 Session 4 – Design for the Invisible Parts of the Ship 1

Session Chair: Hans Hopman

Session Co-chair: Jose Gonsalves

Setting Technical Requirements for Intra-Ship Maritime Communication Services over
3GPP Systems

Dave Michelson, University of British Columbia

Role of Design and Operational Deficiencies on Occupational Accidents Onboard
Merchant Ships

Osman Turan, University of Strathclyde

Reshaping Digital Twin Technology Developments for Enhancing Marine Systems Design

Jose Jorge Garcia Agis, Ulstein International

Permeable Volume – The Forgotten “Galaxy” in Ship Design

Dracos Vassalos, University of Strathclyde

12:00 - 1:30 - Lunch

1:30 - 3:00 Session 5 (Concurrent Session in Isabel MacInnes) - Design Methodology 2

Session Chair: Richard Birmingham

Session Co-chair: Paul Liu

Alternative Design Approach for Ship Damage Stability Enhancement based on
Crashworthiness

Hongseok Bae, University of Strathclyde

Advancing Automation in Early-Stage Navy Ship System Design

Julie Chalfant, Massachusetts Institute of Technology

A Rational Approach to Handle Uncertainty and Complexity in Marine Systems Design

Per Olaf Brett, Ulstein International

A Multi-level Approach to Flooding Risk Estimation of Passenger Ships

Francesco Mauro, University of Strathclyde

**1:30 - 3:00 Session 6 (Concurrent Session in Ruth Blair C) – Hullform and Integrated Design
Environments**

Session Chair: David Andrews

Session Co-chair: Yves-Etienne Landry

The Development of a Planing Boat Model and Environmental Measurements for Free
Running Model Tests

Xinguo Wang, Texas A&M University

Simulation-driven Design Approach for Active Flow Control Measures Targeting Marine
Applications

Jörn Kröger, Hamburg Ship Model Basin (HSVA)

Current State of the VesselJS Library: A Web-based Simulator for Digital Twin of
Maritime Operations

Henrique Gaspar, Norwegian University for Science and Technology

Applying Acausal Physics-Based Modeling and Model-Based Systems Engineering to
Improve System Model Scalability and Reusability

Michael Steffens, Georgia Institute of Technology

3:00 - 3:30 Break

3:30 - 5:30 - Session 7 (5 papers) – Design Education

Session Chair: Chris McKesson

Session Co-chair: Freya Feizitalarpoushti

Naval Wargaming as a Teaching Tool for Warship Design Engineers

Nick Bradbeer, University College London



Learning Design from Day One of Undergraduate Studies
Richard Birmingham, Newcastle University

Innovative Maritime Design Education at NHL Stenden University of Applied Sciences
Sietske de Geus-Moussault, Technical University Delft

Educating the Next Generation Marine Systems design Engineer – the NTNU Perspective
Stein Ove Erikstad, Norwegian University for Science and Technology

Development and Lessons Learned of New Modular Ship Design Activities for Graduate
Education During COVID
Austin Kana, Technical University Delft

Wednesday, June 29

9:00 - 10:00 – Keynote Address

Wireless Channels in Shipboard Environments: Challenges and Opportunities
Dave Michelson, Director, Marine Systems Initiative
University of British Columbia

10:00 - 10:30 – Break

10:30 - 12:00 **Session 8 (Concurrent Session in Isabel MacInnes) Novel Design Concepts 2**

Session Chair: Per Olaf Brett

Session Co-chair: Srisri Mugalur Lakshmanareddy

Numerical, Experimental, and Full-Scale Investigations of Passive Air-Lubrication System for High-Speed Craft
Kourosh Koushan, SINTEF

ModiYacht: Intelligent CAD Tool for Parametric, Generative, Attributive and Interactive Modelling of Yacht Hull Forms
Shahroz Khan, University of Strathclyde

Float Foundation Enables Environmental Benefits for Offshore Industry
Ted Bergman, Elomatic

Early-Stage Design of Novel Vessels: How can we Take a Step Forward?
Nikoleta Dimitra Charisi, Technical University of Delft

10:30 - 12:00 **Session 9 (Concurrent Session in Ruth Blair C) Maritime Logistics**

Session Chair: Julie Chalfant

Session Co-chair: Freya Feizitalarpoushti

Logistics Optimisation of a Fast Catamaran Ferry – A Selection of Optimal Route Considering Battery Weight and Cost
Haibin Wang, University of Strathclyde

Investigating Automation and Future Short Sea Shipping Concepts
Rachel Jean Pawling, University College London

A Quantification of the Risk Reduction Potential of Autonomous Navigation
Jeroen Pruyn, Technical University of Delft

12:00 - 1:30 – Lunch

1:30 - 3:00 **Session 10 (Concurrent Session in Isabel MacInnes) Design Methodology 3**

Session Chair: David Andrews

Session Co-chair: Visal Katamaneni

Vessel Design Considerations to Limit Motion-Induced Sickness and Interruptions
Jonathan Ross, High Ground Initiatives

A Design Decision-Support Environment for Evaluating the Impact of Ship Technologies
Jeff McNabb, Georgia Institute of Technology

A Decision Making Process for the Selection of Better Ship Main Dimensions with the Fuel EEDI Requirements
Sander Calisal, University of British Columbia

An Integrated Simulation Workflow for Automated IMO Maneuverability Verification for Ship Design Based on Computational Fluid Dynamics
Miles Wheeler, Siemens Digital Industries Software

1:30 - 3:00 **Session 11 (Concurrent Session in Ruth Blair C) Sustainable Design**

Session Chair: Stein Ove Erikstad

Session Co-chair: Paul Liu

Ship Design Optimization Framework Considering Future Uncertain Carbon Emission Regulations
Qikun Wei, Huazhong University of Science and Technology

H2Ocean: Design of a Hydrogen Fuel Cell Propelled Passenger Vessel
Graeme Comyn, Capilano Maritime Design Ltd.

Impact of Ship Coatings in Ice Covered Waters
Christian Schroeder, Hamburg Ship Model Basin (HSVA)

Design Novelty and Cost-learning Dynamics in Offshore Fish Farming
Sigurd Solheim Pettersen, DNVGL

3:00 - 3:30 Break

3:30 - 5:00 - **Session 12 - Design for the Invisible Parts of the Ship 2**

Session Chair: Hans Hopman

Session Co-chair: Shane Jiang

Impact of Life-Cycle Considerations on Internal Ship Layout for Damage Stability Protection
Donald Paterson, University of Strathclyde

Extracting Ship Motions from Standard VDR Recordings
Stefan Krueger, Hamburg Ship Model Basin (HSVA)

An Area-specific Survivability Assessment for Passenger Ships
Francesco Mauro, University of Strathclyde

SPAWAVE, an Empirical Method to Predict Wave Added Resistance in all Wave Directions
Rob Grin, MARIN

5:00 – 6:00 - Meet and Greet with UBC Autonomous Sailboat Team(www.ubcsailbot.org)

A fully autonomous sailboat will be presented by members of the UBC Sailbot team. This vessel has been designed and built to perform a fully autonomous crossing from Victoria, BC to Maui, Hawaii.

UBC Gage Towers Courtyard

6:30 - IMDC CONFERENCE DINNER (**recommend leaving Gage at 6:00*)

BierCraft Wesbrook at UBC

3340 Shrum Lane

Thursday, June 30

8:30 – 10:00 Session 13 - Design Methodology 4

Session Chair: Stein Ove Erikson

Session Co-chair: Sanchit Singh Yadav

On-the-fly Design Rationale to Support Real-time Collaboration in Naval Ship Layout Design

Joan le Poole, Technical University Delft

Multidisciplinary Design Analysis and Optimisation of Floating Offshore Wind Turbine Support Structures

Katarzyna Patryniak, University of Strathclyde

Maritime Autonomous System Design Methods and Technology Forecasting

Rohan Patel, Georgia Institute of Technology

First Progress Report on a Novel Idea: Proactive Elicitation for Ship Design

Cheng Feng Ou, Newcastle University

10:00 - 10:30 - Break

10:30 - 12:00 Session 14 - Design Methodology 5

Session Chair: Richard Birmingham

Session Co-chair: Visal Katamaneni

Design Re-Engineering and Automation for Marine Systems

Stein Ove Erikstad, Norwegian University for Science and Technology

Capability-based Approach for Naval Ship Design: A Metric Formulation

Mattia Bottero, University of Genoa

Use of System of Systems Engineering Approach for Ship Design and Task Force Analysis

Nabile Hifi, BAE Systems Naval Ships

Factors Influencing the Economic Feasibility of Unmanned Ships

Carmen Kooji, NHL Stenden

12:00 - 1:30 – Lunch

1:30 - 3:00 Session 15 – Design for Safety

Session Chair: David Andrews

Session Co-chair: Yves-Etienne Landry

Human Factors' Contribution into Maritime Accidents by Applying the SHIELD HF Taxonomy
Beatriz Navas de Maya, University of Strathclyde

Operational Damage Stability by a Nonzonal Damage Stability Approach
Stefan Krueger, Hamburg Ship Model Basin (HSVA)

Performance Comparison of Fouling Control Coatings Based on Time-Dependent Biofouling
Model for Ships
Dogancan Uzun, University of Strathclyde

3:00 - 3:30 Closing Remarks