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)

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

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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