

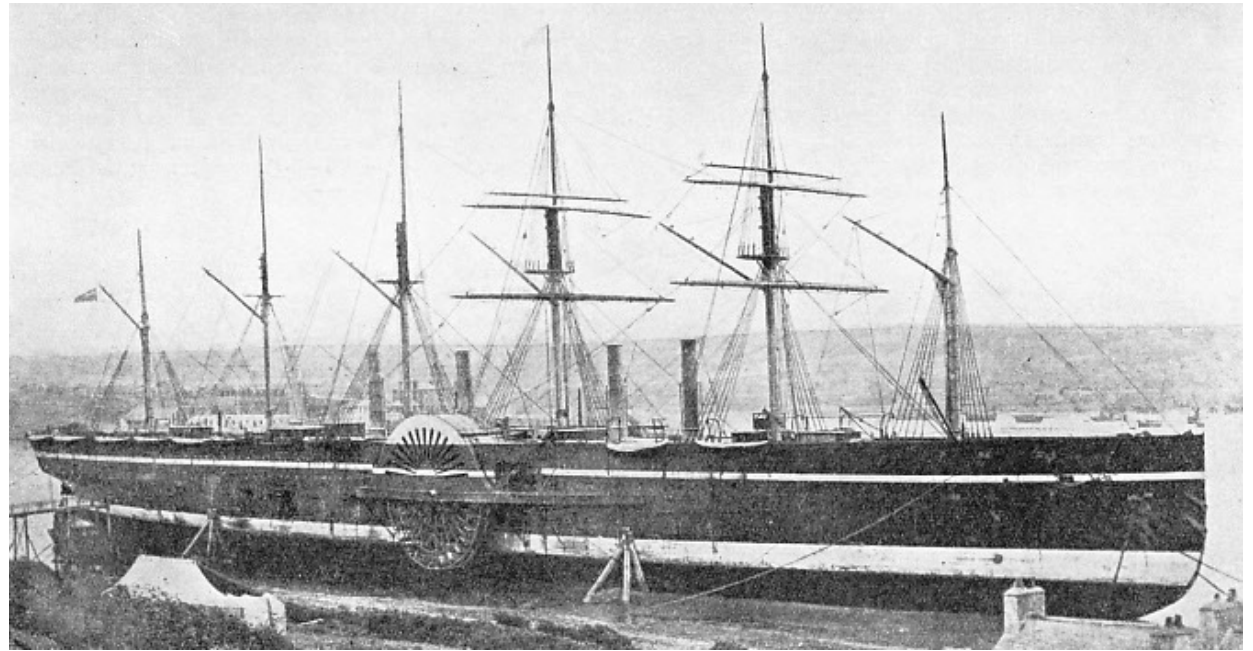


MARINE SYSTEMS INITIATIVE



UBC-IEEE Marine Systems Workshop
Friday, 15 March 2019
08:30-17:00
Kaiser 2020/2030

- Ships will soon undergo their most radical transformation since sail gave way to steam at the end of the 19th century.



- Many of the same technological opportunities - and environmental & safety concerns - that are currently driving change in land transportation are also driving change in the shipbuilding industry.

Four Grand Challenges of Modern Ship Design



1. Dramatically improve the efficiency of ships and reduce GHG emissions from international shipping.



2. Greatly reduce noise pollution caused by shipping and other marine enterprises.



3. Improve shipboard safety and situational awareness in order to avoid the human, economic and environmental impacts of shipboard incidents and collisions at sea.



4. Upgrade the sensor, information, and decision systems aboard ship in order to provide accurate and timely warnings of surface and near-surface threats to both merchant shipping and naval forces



**MARINE
SYSTEMS
INITIATIVE**



The objectives of the **UBC Marine Systems Initiative** are to:

- 1) Create a reliable stream of highly qualified electrical and shipboard systems engineers for the shipbuilding and industrial marine sector, and,
- 2) Address the grand challenges of ship design and contribute to engineering innovation through applied research that benefits both Marine Systems Consortium partners and the broader sector.

Vancouver is one of the largest ports in North America with a burgeoning shipbuilding and industrial marine sector.

The University of British Columbia is consistently ranked among the top 20 public universities in the world.

UBC's Naval Architecture and Marine Engineering program has achieved impressive support and success in recent years.



Now is the time to extend our reach, acknowledge the forces that are driving change in the marine sector, and seek greater involvement of electrical, computer and systems engineers in fundamental aspects of ship design.

Leadership Team



Co-Directors:

Prof. David Michelson (ECE)

Dr. Chris McKesson (MECH)

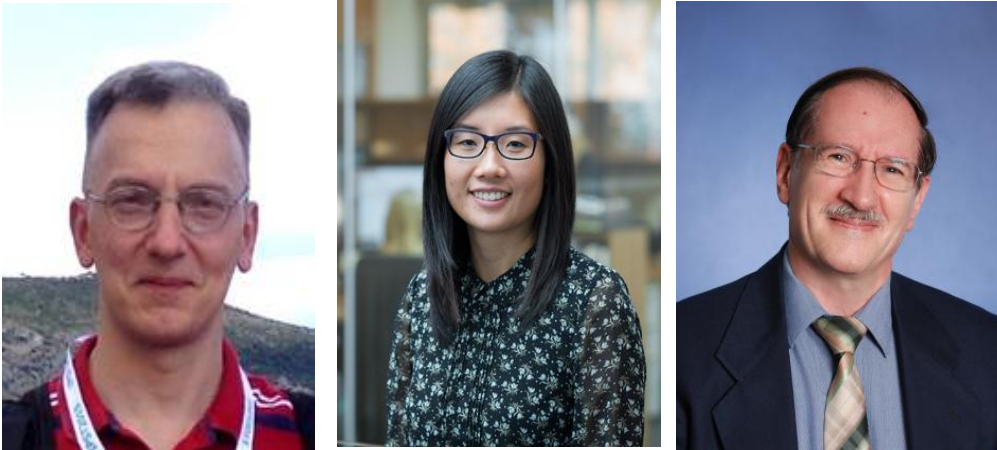


Advisors:

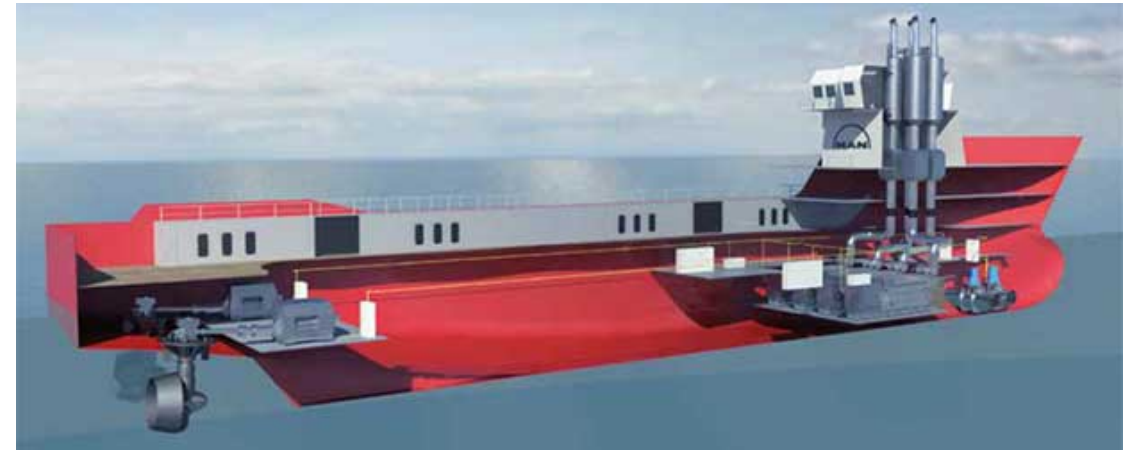
Prof. Jon Mikkelsen (MECH)

Prof. Keith Culver (UBC-O)

Shipboard Power Systems



Prof. Juri Jatskevich
Prof. Christine Chen
Prof. Jose Marti



- Advanced Electrical Power Conversion & Management Techniques
- Integrated Electric Propulsion
- Microgrid System Analysis & Power Conversion Technology

Shipboard Communications, Sensors & EMC



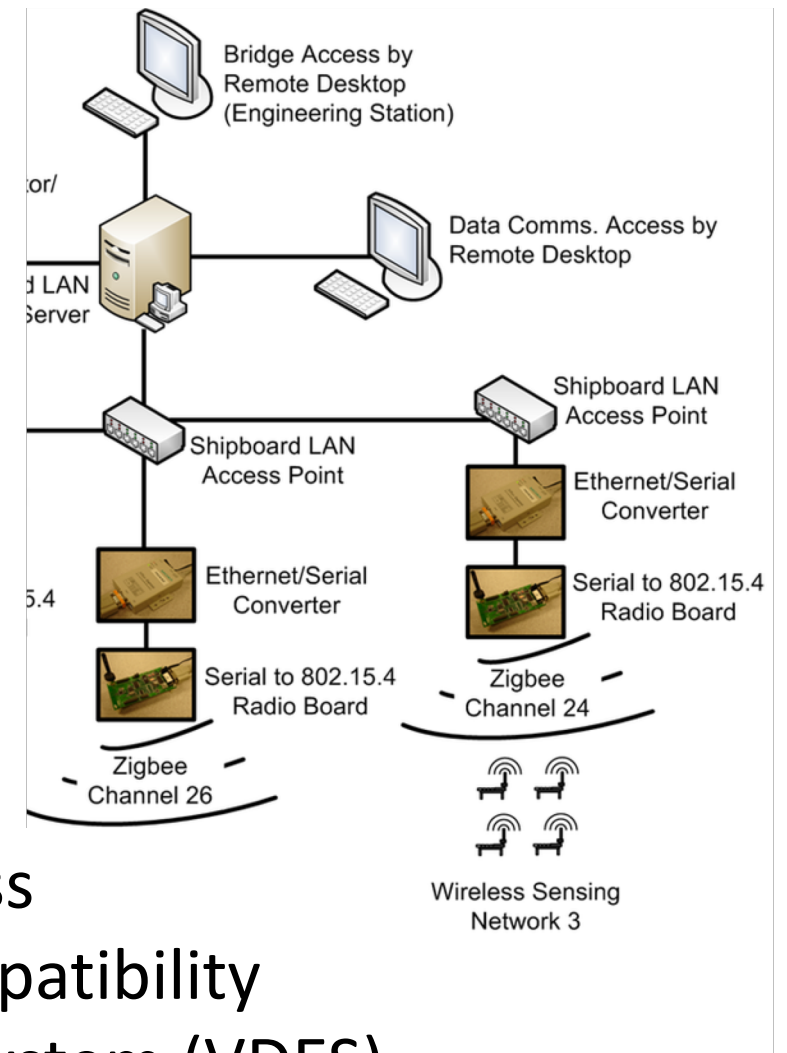
Prof. David Michelson

Prof. Alex Bigazzi

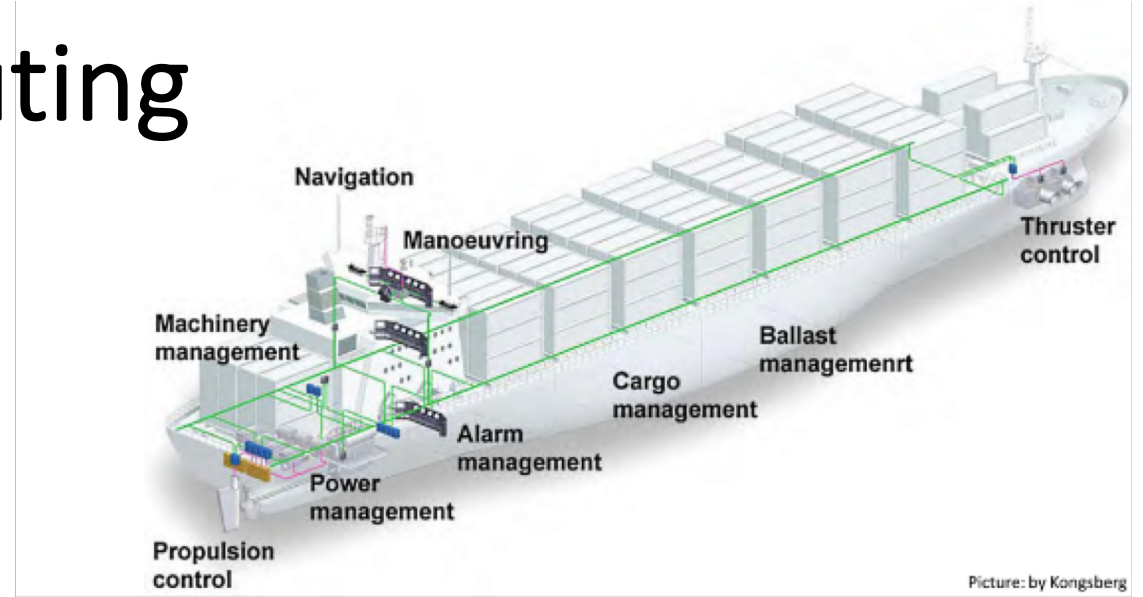
Prof. Naomi Zimmerman

Prof. Michael Brauer

- Shipboard 5G Wireless
- Electromagnetic Compatibility
- VHF Data Exchange System (VDES)
- Next Generation Sensor Networks



Digital Controls & High Performance Computing



Prof. Mieszko Lis
Prof. Ryoza Nagmune
Prof. Rajeev Jaiman
Prof. Jasmin Jelovica

- Advanced Digital Control Systems
- High Performance Computing
- Digital Twins
- Advanced CFD Simulation

Dependable Software & Cybersecurity



Prof. Sathish Gopalakrishnan
Prof. Karthik Pattabiraman
Prof. Konstantin Beznosov
Prof. Julia Rubin

- Techniques for increasing Reliability, Resiliency, Fault-Tolerance, and Dependability Aboard Ships
- Cybersecurity

Human Factors



Prof. Karon MacLean

Prof. Alan Kingstone



UBC's Designing for People (DFP) research network is a center of excellence for human-centered design. MSI-relevant topics include:

- Human Factors Engineering
- Time and Safety Critical factors (TASC)
- Attention in distracting Environments
- Complex Systems Interfaces & Communications

Work with us!

- JOIN the UBC Marine Systems Industry Consortium!
- COLLABORATE on a joint research project!
- SPONSOR an undergraduate capstone project
- ENDOW a scholarship or award
- HIRE a grad student intern or undergrad co-op student

For more information, please contact:
Prof. David Michelson
davem@ece.ubc.ca