

WINTER SCHOOL ON HUMAN FACTORS FOR AUTONOMOUS SHIPS AND REMOTE CONTROL CENTRES



8 – 12 January 2024

NTNU Nyhavna, Skippergata 14, Trondheim

FREE OF CHARGE • LUNCHESES WILL BE SERVED • MAX. 20 PARTICIPANTS

Register below before 23 December 2023:

<https://forms.office.com/e/eftVfCeSFS>

Funded by:

Iceland
Liechtenstein
Norway grants

Organized by:

 NTNU

 Western Norway
University of
Applied Sciences

 SINTEF

PROGRAMME

Day 1 – 8 January 2024 – Not human errors, but human factors

Location and time: Room B214 from 11:30 to 16:00

- Introduction and discussion on how the participants envision autonomous ships would be.
- Key findings from the Human Maritime Autonomy Enable (HUMANE) project.
- Definitions and key principles of human factors and ergonomics.
- Human errors or design-related errors?
- Changes in the maritime industry.

EXERCISE: Exploring the roles and tasks that will be involved in the autonomous ship operation

Day 2 – 9 January 2024 – Work system design

Location and time: Room B214 from 11:30 to 16:00

LECTURE:

- Designing for safety a systems perspective
- Understanding worker capabilities
- Physical ergonomics on ships, enclosed spaces, and mobility
- Human factors issues in bridges, engine rooms and engine control rooms.
- Fatigue and seasickness

EXERCISE: Personas of different roles that will be involved in the autonomous ship operation

Day 3 – 10 January 2024 – How can human factors mitigate safety challenges?

Location and time: Room B214 from 12:00 to 16:00

LECTURE:

- Ship accidents due to issues with human-machine interfaces and high automation
- Crew needs and expectations in the design of bridges and remote control rooms
- User Case: Unified Bridge
- Hazard control measures: Alarm designs and standards
- Human factors issues in remote control rooms.

EXERCISE: Assessing major risks in the autonomous ferry operation using the Bow-tie diagram

Day 4 – 11 January 2024 – Prototype and test

Location and time: Room B214 from 12:00 to 16:00

LECTURE:

- Workload, tasks, and workflow under normal and abnormal ship operations and conditions
- Evaluating designs based on documentation, standards, and regulations
- Assessing workload, boredom, and complacency
- Barriers to the adoption of human-centered design in the maritime industry

EXERCISE: Reviewing and criticizing different designs of ship bridges and remote control rooms

Day 5 – 12 January 2024 – Prototype building and evaluation

Location and time: Room B214 from 09:00 to 13:00

EXERCISE: Imagining and visualizing how remote control rooms for autonomous ships would operate in the future, creating cardboard prototypes, and role-playing. Evaluate the reliability of the proposed designs by considering some dangerous situations, such as fire, communication loss, etc.

BIOGRAPHY OF THE LECTURERS



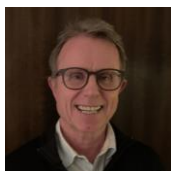
Margareta Lützhöft is a master mariner with a PhD in Human-Machine Interaction and a Professor in the MarSafe group at HVL. Her research interests include human-centered design and the effects of new technology.



Erik Styhr Petersen is a naval architect with a PhD in maritime usability engineering and a senior researcher at both HVL and NTNU. His research interests include usability and the application of human-centered design in the maritime field.



Ole Andreas Alsos is an associate professor at NTNU and the head of the Shore Control Lab. His main research interests focus on the design of shore control centres and human-machine interfaces for autonomous ships.



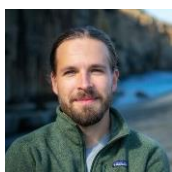
Stig Ole Johnsen is a safety scientist at SINTEF, working with safety science, human factors and design. He is responsible for the Human Factors in Control network in Norway, and has been teaching human factors at NTNU and NORD University. He has been involved in several accident investigations.



Hedvig Aminoff is a postdoctoral researcher at NTNU with a background in Human-Machine Interaction. She is part of the Shore Control Lab and is currently focusing on building knowledge about design of safe automation and remote operations within the MAS project with SINTEF.



Taufik Akbar Sitompul is a postdoctoral researcher at NTNU and a member of the Shore Control Lab. His current research focuses on designing intuitive human-machine interfaces for remotely operated port cranes.



Erik Veitch is a researcher at NTNU and a member of the Shore Control Lab. His research focuses on the design of shore control centres and human-machine interfaces for autonomous ships.

CONTACTS

Taufik Akbar Sitompul
Department of Design, NTNU
Tel: +47 486 616 73
Email: taufik.a.sitompul@ntnu.no

Hedvig Aminoff
Department of Design, NTNU
Tel: +46 739 872 801
Email: hedvig.aminoff@ntnu.no