

SESSION: Innovation and development

MARS Themes:

Innovation and Development

Title:

EXPANDING THE CAPABILITIES OF MARINER 4.0: A HUMAN-CENTRED MONITORING AND RESEARCH TOOL

Author(s): add rows below if more authors

MDA. Melim^[1]

A. Bekker^[1]

K. Kruger^[1]

Affiliation: add rows below for more affiliations

1. Stellenbosch University, Department of Mechanical and Mechatronic Engineering

Abstract:

The maritime industry has witnessed progress in human-centric computing. Among these developments is the human cyber physical system Mariner 4.0, a contribution by Ms. Taylor, a PhD student at Stellenbosch University. Currently implemented on the South African Agulhas ship II, Mariner 4.0 is grounded in a human digital twin framework, digitally mirroring individual seafarers, with a focus on unique states like motion sickness. The primary function of Mariner 4.0 is to monitor and digitize the state of motion sickness in seafarers, creating a service-oriented environment that accurately communicates the individual states of seafarers in real-time.

The content proposed to be communicated at the research session includes enhancing Mariner 4.0 by broadening its capabilities. A central objective of this research is the development of a predictive model for Motion Sickness Incidence. This model harnesses forecasted weather conditions as a primary input to anticipate the ship's motion. By understanding and analyzing the anticipated ship motion, derived from these weather predictions, the model can estimate the likelihood and intensity of motion sickness incidence for individuals aboard. To further this goal, Mariner 4.0 will integrate additional human-centric and environmental metrics. This pro-active approach aims to improve health, safety, and efficiency aboard the South African Agulhas ship II. The data from Mariner 4.0 will be presented in a detailed dashboard, aiding in decision-making, and increasing awareness both on the vessel and ashore. As part of the study, passengers on the South African Agulhas ship II will be equipped with monitoring devices like smartwatches to capture essential human-centric metrics such as heart rate, heart rate variability and body temperature. Participants will also maintain daily diaries and digital questionnaires, detailing their experiences related to various maritime conditions.

Format:

Oral Presentation

Keywords: (add ; between keywords)

Seakeeping; Motion Sickness