

Evaluation of LLM Summaries Based on Your Research Paper

Prompt: Summarize the key findings in Capezza, C., Centofanti, F., Lepore, A., Menafoglio, A., Palumbo, B., and Vantini, S. (2022). Functional regression control chart for monitoring ship CO2 emissions. *Quality and Reliability Engineering International*, 38(3):1519–1537.

Accuracy scale:

Rating	Short description	Detailed description
NA	Not applicable	The response indicated that it does not have the access to the paper/knows the paper
1	Entirely Inaccurate	The answer is entirely inaccurate, demonstrating a lack of understanding or severe misconceptions about the paper.
2	Partially Accurate	The answer shows some understanding of the paper but contains major inaccuracies or omissions that significantly compromise the correctness and/or completeness of the answer.
3	Generally accurate	The answer is generally correct but lacks full depth and/or precision. The answer may contain minor inaccuracies that do not significantly detract from the overall answer.
4	Mostly Accurate	The answer is mostly correct, showing a high level of understanding, but may lack the finer details or show tiny inaccuracies.
5	Entirely Accurate	The answer is entirely accurate, displaying a thorough understanding of the paper, precision in explanation, and all necessary details are accurate.

Our Request to You

We would greatly appreciate it if you could evaluate the below three summaries for accuracy using the scale provided. Kindly fill in the column “Accuracy Rating” in the following table with your evaluations and return it to us through email to i.m.zwetsloot@uva.nl.

Model	Accuracy Rating (1-5)	Comments (optional)
ChatSQC-Research (augment LLM developed by us)		
ChatGPT-3.5		
ChatGPT-4		



Summarize the key findings in Capezza, C., Centofanti, F., Lepore, A., Menafooglio, A., Palumbo, B., and Vantini, S. (2022). Functional regression control chart for monitoring ship CO2 emissions. *Quality and Reliability Engineering International*, 38(3):1519–1537.



The study by Capezza et al. (2022) introduces a functional regression control chart for monitoring ship CO2 emissions. The research focuses on modern ships where data acquisition technologies have led to data-rich environments with continuously streamed and stored variable measurements during navigation. These measurements can be modeled as functional data or profiles. The key findings include the development of a control chart based on scalar-on-function regression for monitoring ship operating conditions and CO2 emissions. The study contributes to the field of process control in the maritime industry, specifically in monitoring and managing CO2 emissions on ships.



You

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ChatGPT

The study by Capezza et al. (2022) introduces a functional regression control chart for monitoring ship CO2 emissions. Key findings include:

1. Development of a novel method: The researchers propose a functional regression control chart that utilizes functional data analysis techniques to monitor and control CO2 emissions from ships.
2. Utilization of functional data: Unlike traditional control charts that rely on scalar data, this method considers CO2 emissions as functional data, which allows for a more comprehensive analysis of emissions patterns over time.
3. Improved monitoring accuracy: By incorporating functional regression techniques, the proposed control chart offers enhanced accuracy in detecting shifts or anomalies in CO2 emissions, thereby improving the effectiveness of monitoring efforts.
4. Practical application: The methodology is applied to real-world data on ship CO2 emissions, demonstrating its feasibility and effectiveness in monitoring emissions trends and identifying potential areas for improvement in environmental performance.

Overall, the study contributes to the field of quality and reliability engineering by providing a new approach for monitoring and controlling CO2 emissions from ships, with potential applications for promoting sustainability in the maritime industry.





You

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The key findings of Capezza et al. (2022) focus on the use of a Functional Regression Control Chart (FRCC) for monitoring CO2 emissions from ships. This method leverages the rapid development in data acquisition technologies on modern ships, which allows for continuous streaming and storage of variable measurements during navigation. These measurements can be modeled as functional data or profiles. The FRCC aims to determine if the observed CO2 emission profile of a ship is as expected, based on given covariate values. It does so by monitoring residuals obtained from a multivariate functional linear regression of the CO2 emission profiles on the functional covariates. The study demonstrates the application of FRCC through a case study of a Ro-Pax ship in the Mediterranean Sea and discusses its advantages over other alternatives in practical examples.

