

Review Form 3

Journal Name:	Journal of Engineering Research and Reports
Manuscript Number:	Ms_JERR_122461
Title of the Manuscript:	Control Strategies for Digital Twin Systems
Type of the Article	

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PART 1: Review Comments

Compulsory REVISION comments	Reviewer's comment	Author's Feedback <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
<p>Please write a few sentences regarding the importance of this manuscript for the scientific community. Why do you like (or dislike) this manuscript? A minimum of 3-4 sentences may be required for this part.</p>	<p>The manuscript addresses a critical and timely topic in the field of industrial maintenance, particularly the integration of digital twin technology and self-healing capabilities into health operation and maintenance (HOM) strategies for complex equipment. This area of research is of significant importance to the scientific community as it aligns with the ongoing advancements in predictive maintenance and smart manufacturing. However, while the manuscript touches on relevant concepts, it lacks the necessary detail to make a strong impact. The generalization of the methodology and the absence of specific algorithms or models reduce its potential contribution to advancing the field. I appreciate the manuscript's focus on an important issue, but it requires further development to fully meet the standards of scientific rigor and innovation expected by the community.</p>	
<p>Is the title of the article suitable? (If not please suggest an alternative title)</p>	<p>The current title of the article, "Control Strategies for Digital Twin Systems," is somewhat broad and does not fully capture the specific focus on health operation and maintenance and self-healing in complex equipment, which are highlighted in the manuscript.</p> <p>Suggestion:</p> <ul style="list-style-type: none"> • "Integrating Self-Healing and Predictive Maintenance in Complex Systems through Digital Twin Technology", or • "Digital Twin-Driven Health Operation and Maintenance Strategies for Complex Equipment with Self-Healing Capabilities" 	
<p>Is the abstract of the article comprehensive? Do you suggest the addition (or deletion) of some points in this section? Please write your suggestions here.</p>	<p>The abstract of the article provides a general overview of the research focus, including the importance of HOM for complex equipment, the role of digital twin technology, and the integration of self-healing states. However, it could benefit from some enhancements to improve clarity and comprehensiveness. My take:</p> <ol style="list-style-type: none"> i. The abstract should more clearly articulate the specific problem the research is addressing. It currently mentions the need for a more generalized and complete set of HOM methods but doesn't explicitly state what the gaps in existing research or practices are. ii. It briefly mentions the use of different research methods but lacks specifics. Adding a sentence or two that outlines the key methodological approaches, such as the use of predictive analytics, data-driven models, or game theory for decision-making, would provide a clearer picture of how the research was conducted. iii. The abstract should emphasize what is new or unique about the research. It would benefit from a statement that clearly highlights the novel contributions, such as the development of specific self-healing models or the innovative application of digital twin technology in predictive maintenance. iv. Lacks inclusion of how the proposed strategies could improve maintenance efficiency, reduce costs, or enhance the reliability of complex equipment. 	
<p>Are subsections and structure of the manuscript appropriate?</p>	<p>Yes.</p>	
<p>Please write a few sentences regarding the scientific correctness of this manuscript. Why do you think that this manuscript is scientifically robust and technically sound? A minimum of 3-4 sentences may be required for this part.</p>	<p>The manuscript touches on relevant and timely topics, such as digital twin technology and the concept of self-healing in the maintenance of specialized complex equipment, which are critical areas in modern industrial research. However, the scientific robustness and technical soundness of the manuscript are somewhat limited by the lack of detailed methodology and specific implementation strategies. While the concepts discussed are scientifically valid, the absence of concrete algorithms, models, and a clear validation framework raises concerns about the technical execution of the research. To be considered scientifically robust, the manuscript would need to provide more detailed and specific approaches to demonstrate how the proposed strategies can be effectively implemented and validated in practice.</p>	

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<p>Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.</p> <p>-</p>	<p>The references in the manuscript seem to cover a range of relevant topics, including digital twin technology, predictive maintenance, and health operation and maintenance strategies. However, incorporating recent review papers or case studies that explore the implementation of digital twins in various industries could provide a broader context and strengthen the manuscript's foundation. This includes concept of self-healing is derived from material science or similar fields, it would be useful to include recent studies that have explored new self-healing mechanisms and their applications.</p>	
<p><u>Minor REVISION</u> comments</p> <p>Is the language/English quality of the article suitable for scholarly communications?</p>	<p>The language quality of the article appears to be generally understandable. There may be instances where the grammar and sentence structure could be refined to improve readability and precision. Consider having the manuscript for proofread.</p>	
<p><u>Optional/General</u> comments</p>	<ol style="list-style-type: none"> 1. The methodology appears to be in a preliminary stage, with the authors possibly still exploring different approaches and refining their research strategy. This exploratory nature is common in initial findings, but it also means that the methodology might not yet be robust enough to provide definitive results. 2. The methodology section covers a wide range of techniques and concepts, from stochastic processes and degradation trajectory analysis to the use of game-theoretical methods and digital twin integration. However, the descriptions are often broad and lack the specificity needed to understand how these methods will be concretely applied to achieve the research objectives. 3. There may be inconsistencies in how certain concepts are defined or applied within the methodology, which could lead to confusion or misinterpretation of the findings. 4. The paper introduces several complex concepts, such as digital twins, self-healing states, and game theory, but the methodology does not clearly explain how these concepts will be integrated into a cohesive research framework. The connections between these elements are implied but not fully developed. 5. Consider incorporating location-based elements, such as Geographical Information System (GIS) technologies, into the facility management and HOM strategies discussed in the manuscript. GIS can enhance the effectiveness of these strategies by providing spatial context and enabling more precise monitoring and management of complex equipment across different locations. 	

PART 2:

	<p>Reviewer's comment</p>	<p>Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</p>
<p>Are there ethical issues in this manuscript?</p>	<p><i>(If yes, Kindly please write down the ethical issues here in details)</i></p>	

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