

### Review Form 3

Journal Name:	<a href="#">Asian Journal of Advanced Research and Reports</a>
Manuscript Number:	Ms_AJARR_127166
Title of the Manuscript:	ARTIFICIAL NEURAL NETWORK BASED PERFORMANCE PREDICTION SYSTEM FOR SPARK IGNITION ENGINES
Type of the Article	Original Research Article

#### **General guidelines for the Peer Review process:**

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound. To know the complete guidelines for the Peer Review process, reviewers are requested to visit this link:

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#### **PART 1: Review Comments**

<b><u>Compulsory</u> REVISION comments</b>	<b>Reviewer's comment</b>	<b>Author's Feedback</b> <i>(Please correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)</i>
<b>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.</b>		
<b>Is the title of the article suitable? (If not please suggest an alternative title)</b>		
<b>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.</b>		
<b>Are subsections and structure of the manuscript appropriate?</b>		
<b>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.</b>		
<b>Are the references sufficient and recent? If you have suggestions of additional references, please mention them in the review form.</b>		

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<p>Minor REVISION comments</p> <p><b>Is the language/English quality of the article suitable for scholarly communications?</b></p>		
<p><u>Optional/General</u> comments</p>	<p><b>ARTIFICIAL NEURAL NETWORK BASED PERFORMANCE PREDICTION SYSTEM FOR SPARK IGNITION ENGINES</b></p> <p>(1) Importance of the Manuscript:</p> <p>This manuscript addresses an important and timely topic in the quest for efficient and environmentally friendly spark ignition (SI) engines. The application of Artificial Neural Networks (ANNs) for predicting engine performance offers a robust alternative to traditional methods, providing significant potential for optimization and emissions reduction. The comprehensive use of MATLAB neural network tools and the validation of results through statistical analysis strengthen its relevance to the scientific community. The focus on designing and testing ANN architectures makes it a valuable resource for researchers working on engine performance modeling and optimization.</p> <p>(2) Suitability of the Title:</p> <p>The title is suitable and accurately reflects the core focus of the manuscript. However, for enhanced clarity and to attract a broader audience, I suggest the following alternative: "Performance Prediction for Spark Ignition Engines Using Artificial Neural Networks: Model Design and Validation".</p> <p>(3) Comprehensiveness of the Abstract:</p> <p>The abstract is comprehensive, providing a clear overview of the research objectives, methodology, and key findings. However, the following suggestions may enhance its effectiveness:</p> <ul style="list-style-type: none"><li>• Explicitly state the specific performance metrics analyzed (e.g., fuel efficiency, emissions, power output) to provide more clarity.</li><li>• Briefly mention the experimental setup or the range of operating conditions under which the ANN was validated.</li><li>• Include a concluding remark emphasizing the potential practical applications of the developed ANN-based system in real-world engine optimization scenarios.</li></ul> <p>(4) Subsections and Structure of the Manuscript:</p> <p>The subsections and structure appear to be appropriate for a technical manuscript. However, ensure that sections such as "Introduction," "Methodology," "Results and Discussion," and "Conclusion" are clearly delineated and logically ordered. Adding a "Limitations and Future Work" subsection would further strengthen the manuscript by addressing potential challenges and areas for further exploration.</p> <p>(5) Scientific Correctness:</p> <p>This manuscript appears to be scientifically robust and technically sound. The development and validation of the ANN-based model are presented with sufficient rigor, using regression analysis and statistical validation to support the findings.</p> <p>The detailed explanation of network architecture selection (activation function, hidden layers, and training function) enhances the credibility of the results.</p> <p><b>SUGGESTIONS</b></p>	

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	<ul style="list-style-type: none"> <li>- It is important to clearly state the number of dataset trained using the ANN Model</li> <li>- How many dataset did you present for training, testing and validation?</li> <li>- Show the graphical representation of the ANN system architecture</li> <li>- A flow chart representing the entire system will be a good idea</li> <li>- Regression result for training, testing and validation is important</li> <li>- Error histogram plot must be presented.</li> <li>-</li> </ul> <p>The use of the t-test to establish the reliability of predictions further confirms the robustness of the methodology. However, including a comparison with other machine learning methods could further substantiate the manuscript's contribution.</p> <p>(6) References: The references appear relevant and adequately cover the topic, but old citations and references are considered in the study. It would be advisable to include more recent studies (from 2017 till date) to ensure that the manuscript reflects the latest advancements in ANN applications for engine performance modeling. Suggested references could include recent works in the fields of computational intelligence or AI-driven engine performance optimization.</p> <p>I suggest the papers attached below:</p> <p>(i) The Application of Artificial Neural Network in Prediction of the Performance of Spark Ignition Engine Running on Ethanol-Petrol Blends DOI: <a href="https://doi.org/10.56431/p-s8q66c">https://doi.org/10.56431/p-s8q66c</a></p> <p>(ii) Performance Prediction of a Stirling heat engine using Artificial Neural Network model DOI: <a href="https://doi.org/10.1109/icABCD49160.2020.9183890">10.1109/icABCD49160.2020.9183890</a></p> <p>(iii) A neural network-based prediction of oscillatory heat transfer coefficient in a thermo-acoustic device heat exchanger DOI: <a href="https://doi.org/10.1109/icABCD49160.2020.9183877">10.1109/icABCD49160.2020.9183877</a></p> <p>(iv) Performance analysis of stirling engine using computational intelligence techniques (ANN &amp; Fuzzy Mamdani Model) and hybrid algorithms (ANN-PSO &amp; ANFIS) DOI: <a href="https://doi.org/10.1007/s00521-022-07385-0">10.1007/s00521-022-07385-0</a></p>	
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**PART 2:**

	Reviewer's comment	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)
Are there ethical issues in this manuscript?	<i>(If yes, Kindly please write down the ethical issues here in details)</i>	

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