



Title (22pt, min 10 words, max 20 words)

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ABSTRACT

Write an abstract of 150–250 words that clearly summarizes the research purpose, methods, key results, and main conclusions in a single coherent paragraph without citations or abbreviations.

Keywords Keyword 1, Keyword 2, (min 5, max 8)

INTRODUCTION

Write an introduction that begins by explaining the research background and context, followed by a clear identification of the problem gap supported by recent and relevant studies cited using IEEE style — for example, “as shown in [1],” or “several studies [2], [3] have demonstrated...”; then justify the significance of addressing the problem and summarize limitations of previous works; next, clearly state the aim, scope, and approach of your research, emphasizing how it improves upon prior studies; finally, conclude the introduction by highlighting the main objectives, research questions, and key contributions or novelty of your work in a cohesive and logically structured paragraph.

Literature Review

Write a comprehensive and critical literature review that begins by introducing the theoretical foundation or main concept of your study, supported by key definitions and models from reputable sources cited in IEEE format (e.g., as stated in [1] or studies in [2], [3] have shown...). Then, organize prior works logically — by themes, chronological development, methods, or research domains — to show how the field has evolved and where inconsistencies or gaps exist.

In each thematic section, summarize and analyze the methods, datasets, findings, and conclusions of relevant studies, discussing their strengths, weaknesses, and limitations. Use comparative and transitional sentences to show relationships among studies (e.g., “Unlike [4], which focused on..., this study explores...”).

Next, synthesize these findings to highlight what is already known, what remains uncertain, and where improvement or innovation is needed, making sure to maintain an objective and academic tone.

Finally, conclude the literature review by clearly stating the identified research gap, the rationale for your study, and how your work extends, refines, or contrasts with prior research — ensuring a smooth transition to the methodology section.

Method

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Additional Information and
Declarations can be found on
[page 192](#)

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Subchapter

In the Methodology section, you must provide a clear, detailed, and reproducible explanation of your research process — and it is mandatory to include a flowchart, formulas, and pseudocode to strengthen scientific transparency and readability.

Begin by introducing the overall research design and explaining each stage of the process using a flowchart (for example: “The overall workflow of the proposed model is illustrated in figure 1.”). The flowchart should visually depict key steps such as data collection, preprocessing, model training, evaluation, and validation.

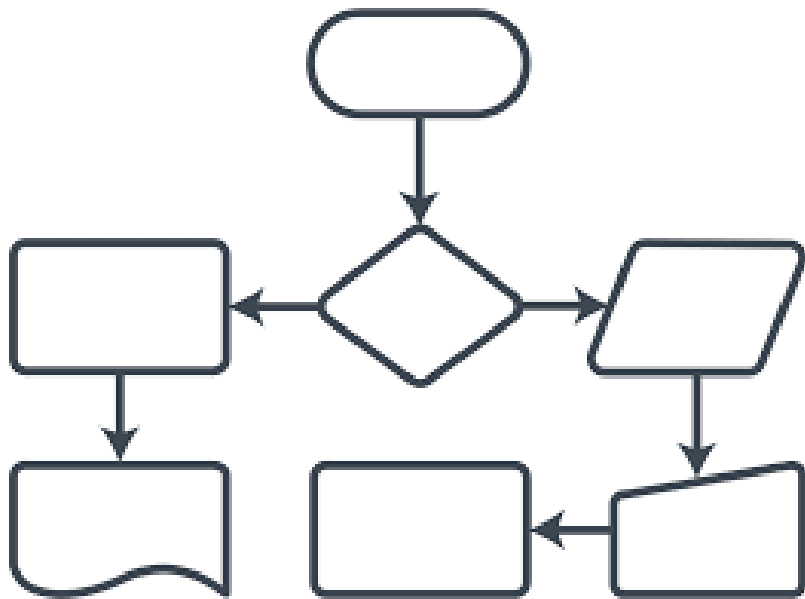


Figure 1 Research Step

Next, describe the dataset or input data, detailing its source, size, attributes, and preprocessing steps, with citations in IEEE format (e.g., “Data were collected from the Kaggle repository [1].”).

Then, present the mathematical formulas used to define your models or evaluation metrics. Each formula must be numbered and referred to within the text, such as:

“The Root Mean Square Error (RMSE) is calculated using Equation (1).”

$$RMSE = \sqrt{\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2} \quad (1)$$

Follow this with a description of your algorithmic procedure or model implementation, written in pseudocode format for clarity. Mention it explicitly in the text, for instance:

“The detailed steps of the proposed algorithm are presented in Algorithm 1.”

Finally, summarize the methodological workflow by connecting the flowchart,

formulas, and pseudocode — making it easy for readers to replicate your approach. Each component (figure, table, formula, and algorithm) should be properly numbered and referenced (e.g., “as shown in figure 2 and Eq. (3)”) to comply with standard IEEE-style academic writing.

Result

Purpose of the Section

The **Results and Discussion** section serves to clearly present, analyze, and interpret the findings of the study. It should demonstrate how the research outcomes support the stated objectives, reveal important patterns, and provide comparisons with prior studies. This section is both descriptive and analytical, emphasizing not only what was found but also what those findings mean.

Introduction to the Section

Begin the section with a short overview of what will be discussed. This introduction helps the reader understand the flow and purpose of the section. Example:

This section presents the experimental results obtained from the proposed model, followed by an in-depth discussion of their significance and comparison with existing methods.

Presenting Results

Present the main findings of your study clearly and logically. Use tables and figures to summarize quantitative data, and ensure that every visual element is mentioned in the text before it appears. Tables must have titles placed above them, while figures should have captions below them. Maintain a consistent format such as “Table 1,” “Table 2,” “Figure 1,” and “Figure 2.” Each visual must be explained and interpreted immediately after it is presented to avoid leaving data without context.

Example of table mention:

The performance comparison between the proposed model and baseline algorithms is shown in Table 1. As can be seen, the proposed CNN-LSTM model achieved the highest accuracy among all evaluated methods.

Table 1 Game Genre Interaction Summary						
Genre	Visits	Likes	Dislikes	Favorites	Active Users	Server Size
Shopping	2.80B	1,000,000	124,000	3,438,844	19,469	24
Survival	988.30M	982,000	107,000	2,911,356	2,709	45
Simulation	765.90M	746,000	101,000	635,262	22,155	20
Sports and Racing	355.70M	241,000	52,000	358,703	3,445	10
Action	2.40B	1,000,000	245,000	2,363,252	9,035	16

After the table, describe the insight derived from it. *The improvement in performance suggests that the convolutional layers enhance the feature extraction process prior to sequence learning, leading to*

better generalization capability.

Including Figures

Figures should be used to visually illustrate key findings such as performance curves, accuracy trends, or error distributions. Reference them in the text and provide captions directly below each image.

Example of figure mention:

The accuracy convergence of the proposed model during training and validation is illustrated in Figure 1.

Figure 1. Accuracy curve of the proposed CNN-LSTM model during training and validation.

After mentioning the figure, interpret what it shows.

As illustrated in Figure 1, the accuracy stabilizes after approximately 25 epochs, indicating that the model reaches convergence without overfitting.

Presenting Formulas or Metrics

Mathematical formulas should be included when explaining evaluation metrics or computational methods. Each formula must be numbered sequentially and mentioned in the text for clarity.

Example of formula mention:

The Root Mean Square Error (RMSE) was computed using Equation (1).

$$RMSE = \sqrt{\frac{1}{n} \sum_{i=1}^n (y_i - \hat{y}_i)^2} \quad (1)$$

Follow this with an interpretation.

A smaller RMSE value indicates higher predictive accuracy, meaning the predicted values are closer to the actual observations.

Comparative Analysis

Compare your findings with baseline models, prior studies, or industry benchmarks to highlight improvements. Use tables or figures to show comparative results, and cite relevant works using IEEE format.

Example of comparison: *Compared with the model proposed in [5], the accuracy of the proposed CNN-LSTM increased by 7.3%, demonstrating the benefit of spatial feature extraction before temporal modeling.*

Table 2 Expanded Game Genre Interaction Table						
Genre	Visits	Likes	Dislikes	Favorites	Active Users	Server Size
Shopping	2,800,000,000	1,000,000	124,000	3,438,844	19,469	24
Survival	988,300,000	982,000	107,000	2,911,356	2,709	45
Simulation	765,900,000	746,000	101,000	635,262	22,155	20
Sports and Racing	355,700,000	241,000	52,000	358,703	3,445	10
Action	2,400,000,000	1,000,000	245,000	2,363,252	9,035	16

Discussion and Interpretation

In the discussion, interpret the results rather than restating them. Explain why the observed results occurred, what trends or patterns can be seen, and how they relate to previous research. Address the implications and any limitations of your findings.

Example:

The superior performance of the CNN-LSTM model, as presented in Table 1, can be attributed to the convolutional layers' ability to capture local spatial dependencies before the LSTM layer processes temporal sequences. This finding is consistent with the results of [7], which also highlighted the advantages of hybrid architectures for sequential data. Nevertheless, the model's training time is relatively longer, which may pose challenges for large-scale real-time applications.

Integrating Figures, Tables, and Equations

Ensure that all visual and mathematical elements are properly referenced and integrated into the text. Use consistent numbering for every table, figure, and equation. Example:

As shown in Figure 2 and Equation (2), the reduction in loss correlates with improved accuracy, confirming the model's strong generalization capability.

Maintain the same format throughout the section to enhance readability and consistency.

Summary of Results

End the section with a concise summary that emphasizes the main findings and links them to the research objectives. This final paragraph should prepare the reader for the conclusion section.

Example:

In summary, the experimental results confirm that the proposed CNN-LSTM model achieved superior performance across all metrics. The discussion demonstrates that combining convolutional and recurrent layers enhances accuracy and stability, validating the effectiveness of the proposed approach for time-series classification tasks.

Discussion

Ensure that the section includes all of the following: a clear introductory paragraph, properly labeled tables and figures (Table 1, Table 2, Figure 1, Figure 2), numbered equations, comparative analysis with IEEE-style citations, interpretation of findings, discussion of implications and limitations, and a final summary paragraph connecting the results to the research objectives.

Conclusion

Purpose of the Section

The **Conclusion** section should provide a clear, concise, and comprehensive

summary of the entire research. It serves to reaffirm the main objectives, highlight key findings, explain their implications, and suggest directions for future work. This section should not repeat data or figures but rather emphasize what was achieved and why it matters.

Structure of the Conclusion

Begin by restating the **research purpose and problem statement** in one or two sentences. Clearly remind the reader what your study set out to achieve.

Example:

This study aimed to develop a hybrid CNN-LSTM model to enhance time-series classification accuracy by combining spatial and temporal feature learning.

Continue by summarizing the **main findings or results** in relation to the objectives of the study. Avoid including raw numbers or new data; instead, focus on what the findings mean.

Example:

The experimental results demonstrated that the proposed model achieved the highest accuracy and stability compared to baseline methods, confirming the effectiveness of hybrid deep learning architectures.

Next, describe the **significance or contribution** of the research. Explain how your findings contribute to the field, solve an existing problem, or open new opportunities for research or practical application.

Example:

The findings contribute to the development of robust neural network architectures for sequential data analysis and can be applied in various domains such as financial forecasting and sensor-based monitoring.

Afterward, mention the **limitations** of your study briefly and honestly. This shows academic maturity and helps contextualize your work.

Example:

However, the model requires a large amount of training data and computational resources, which may limit its use in real-time or resource-constrained environments.

Finally, end the section with a **recommendation or future research direction** that naturally follows from your work.

Example:

Future studies may explore lightweight architectures or optimization techniques to improve computational efficiency while maintaining accuracy.

Writing Guidelines

The conclusion should be written in **one cohesive paragraph or two short paragraphs** (around 150–250 words). It must not introduce new figures, tables, or references unless absolutely necessary. Use formal and confident language such as “*This study confirms...*,” “*The results suggest...*,” or “*Future research should focus on...*”.

Ensure logical flow from objectives → findings → implications → limitations → future work.

Example of a Well-Structured Conclusion

This study proposed a hybrid CNN-LSTM model designed to improve the accuracy of time-series data classification. The experimental results showed that the model outperformed existing LSTM and GRU methods in all evaluation metrics, demonstrating the benefit of combining spatial and temporal feature extraction. These results confirm the effectiveness of hybrid deep learning architectures for complex data patterns. The findings contribute to advancing predictive modeling techniques and can be adapted for various real-world applications. However, the model's reliance on large datasets and computational power poses limitations for practical deployment. Future research should focus on developing lightweight variants of the architecture and exploring real-time optimization strategies to enhance scalability and performance.

Declarations

Author Contributions

Conceptualization: F.A., S.A., and T.A.; Methodology: S.A.; Software: F.A.; Validation: F.A., S.A., and T.A.; Formal Analysis: F.A., S.A., and T.A.; Investigation: F.A.; Resources: S.A.; Data Curation: S.A.; Writing Original Draft Preparation: F.A., S.A., and T.A.; Writing Review and Editing: S.A., F.A., and T.A.; Visualization: F.A.; All authors have read and agreed to the published version of the manuscript.

***FA is abbreviation of "Firs Author", SA is abbreviation of "Second Author", and TA is abbreviation of "Third Author".**

Data Availability Statement

The data presented in this study are available on request from the corresponding author.

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Institutional Review Board Statement

Not applicable.

Informed Consent Statement

Not applicable.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

References

Purpose of the Section

The **References** section provides complete and verifiable information about all sources cited in the manuscript. It strengthens the credibility of your research by ensuring that every claim, comparison, or idea is supported by reliable academic work. All references must follow **IEEE citation style** and include a **DOI (Digital Object Identifier)** whenever available, as it serves as a permanent and traceable link to the original source.

General Guidelines

Each work cited in the text must appear in the References section, and every entry in the References section must be cited in the manuscript. References are listed **in the order of citation**, not alphabetically.

All **journal articles, conference papers, and book chapters** must include a **DOI** — this is mandatory for proper indexing and validation. If a DOI is not available, include an **official URL or repository link** with an access date.

The DOI must appear at the **end of the reference**, formatted as:

doi: 10.xxxx/xxxxxx (without “https://doi.org/”)

In-Text Citation Format

Use numbered brackets for all citations. Place them before punctuation marks, and use commas or dashes for multiple citations.

Examples:

Explainable AI has been widely adopted in blockchain systems [1].

Several studies [2], [3] confirmed the effectiveness of hybrid neural models.

This approach is consistent with previous findings [4]–[6].

Reference List Formatting

Begin with the heading **References** (bold or capitalized). Each entry begins with its number, followed by authors, title, source, publication details, year, and DOI.

The general IEEE reference structure is:

Number **Author(s), “Title of paper/book/chapter,” Source Title, vol., no., pp., year, doi: xxxx.**

Below are examples with DOI included for different source types.

Journal Article

Format:

[1]A. Author, B. Author, and C. Author, “Title of paper,” *Journal Name*, vol. x, no. x, pp. xx–xx, Year, doi: 10.xxxx/xxxxxx.

Example:

[1] J. Brown and T. Green, “Explainable AI in Smart Contract Auditing,” *IEEE Access*, vol. 12, no. 5, pp. 10245–10257, 2024, doi: 10.1109/ACCESS.2024.3381127.

Conference Paper

Format:

[2] A. Author and B. Author, "Title of paper," in *Proceedings of the Conference Name*, City, Country, Year, pp. xx–xx, doi: 10.xxxx/xxxxxx.

Example:

[2] L. Wang and M. Singh, "Quantum-Inspired Optimization for Financial Forecasting," in *Proceedings of the 2023 International Conference on Quantum Computing and AI*, Tokyo, Japan, 2023, pp. 210–215, doi: 10.1109/QCAI.2023.011022.

Book

Format:

[3] A. Author, *Title of the Book*, Edition (if any). City: Publisher, Year, doi: 10.xxxx/xxxxxx.

Example:

[3] I. Goodfellow, Y. Bengio, and A. Courville, *Deep Learning*. Cambridge, MA: MIT Press, 2016, doi: 10.5555/3086952.

Book Chapter

Format:

[4] A. Author, "Title of chapter," in *Title of Book*, B. Editor, Ed. City: Publisher, Year, ch. x, pp. xx–xx, doi: 10.xxxx/xxxxxx.

Example:

[4] R. Patel, "Applications of Federated Learning," in *Advances in Distributed AI Systems*, J. Lee, Ed. Singapore: Springer, 2022, ch. 3, pp. 45–67, doi: 10.1007/978-981-19-2939-2_3.

Website or Online Source

Format:

[5] Organization or Author, "Title of page or document," Website Name, Year. [Online]. Available: URL (accessed: Month Day, Year).

Example:

[5] OpenAI, "GPT Models and Research," OpenAI Official Website, 2025. [Online]. Available: <https://openai.com/research> (accessed: Oct. 25, 2025).

(Note: If the website has a DOI, use the DOI instead of the URL.)

Dataset or Repository

Format:

[6] Author or Organization, "Dataset title," Year. [Online]. Available: URL (accessed: Month Day, Year), doi: 10.xxxx/xxxxxx.

Example:

[6] Kaggle, "Students Performance in Exams Dataset," 2023. [Online]. Available: <https://www.kaggle.com/datasets/spscientist/students-performance-in-exams> (accessed: Oct. 25, 2025), doi: 10.34740/KAGGLE.DS/2126352.

Software or Tool

Format:

[7] Organization or Developer, *Software Name*, Version, Year. [Online]. Available: URL, doi: 10.xxxx/xxxxxx.

Example:

[7] MathWorks, *MATLAB*, Version R2024a, 2024. [Online]. Available: <https://www.mathworks.com>, doi: 10.5281/zenodo.1234567.

Writing Recommendations

Every reference must contain the **DOI** (Digital Object Identifier) if available. This requirement applies to journal articles, conference papers, books, and datasets. Entries without DOI should include a **verified URL** and **access date**.

Ensure that:

References are single-spaced, with one blank line between entries.

All in-text citations match the numbered references.

Each reference includes complete metadata: authors, year, title, publication source, pages, and DOI.

The DOI is placed at the end of the reference and is not hyperlinked.

Example of a Complete References Section

References

- [1] P. Dillenbourg, "The evolution of research on Digital Education," *International Journal of Artificial Intelligence in Education*, vol. 26, no. 2, pp. 544–560, Feb. 2016. doi:10.1007/s40593-016-0106-z
- [2] N. G. Narin, "A content analysis of the metaverse articles," *Journal of Metaverse*, vol. 1, no. 1, pp. 17–24, 2021.
- [3] Y. Kang, U. Lee, and S. Lee, "Who makes popular content? information cues from content creators for users' game choice: Focusing on user-created content platform 'Roblox,'" *Entertainment Computing*, vol. 50, no. May., pp. 1–10, May 2024. doi:10.1016/j.entcom.2024.100697