

**The title is clear, informative, and no more than 4 lines or 15 words
(max). (Heading 1, center, 14 pt)**

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Abstract

*Abstracts and Keywords must be written in **English**, italicized, 10pt, and include a concise summary of the research's background, objectives, method(s), findings, and implications. The abstract is limited to 250 words, written in a single paragraph with single spacing and no references or formulas.*

Keywords: *Keywords are in italics, at least 3-5 words or phrases that reflect the contents of the article (alphabetically).*

I. INTRODUCTION

The Introduction must establish the scholarly context and rationale of the study in a clear and logically developed narrative. It should present the research background and problem, relevant current phenomena or supporting evidence, the most pertinent previous studies, the unresolved research gap, the novelty or specific contribution of the study, and the research objectives. The relationship between previous research and the problem addressed in the present study must be critically established rather than presented merely as a descriptive summary of the literature.

The Introduction should conclude by clearly articulating the contribution and significance of the study to the relevant field. Subheadings within the Introduction are generally not permitted. An exception may be made for manuscripts proposing a new architecture, framework, model, or similarly substantial methodological contribution, where limited subsections are necessary to establish the conceptual or architectural rationale of the proposed approach. Authors should nevertheless maintain a coherent narrative flow and avoid unnecessary fragmentation of the Introduction.

II. LITERATURE REVIEW/RELATED WORK

This section describes the relevant theories behind the research topic and provides a review of relevant prior studies. It also serves as a reference and justification for conducting this research. If there is a hypothesis, it may be communicated implicitly and is not required to be posed as a question.

A. Manuscript Preparation Guideline

The manuscript must be prepared using Times New Roman, 11 pt as the primary font. The manuscript should maintain consistent formatting throughout all sections. Authors are expected to use continuous academic prose and to minimize the use of bullet points and numbered lists. Bullet points or numbering should generally be reserved for section, subsection, and sub-subsection structures. When a substantial amount of information would otherwise require multiple bullet points, authors are encouraged to organize the information into an appropriate table.

B. Paragraph Flow Guideline

Authors must maintain logical continuity between sentences and paragraphs. As a general rule, each standard paragraph should contain a minimum of four complete sentences that collectively develop one principal idea. Single-sentence or excessively short paragraphs should be avoided. An exception may be made for explanatory text immediately following an equation or other situations where a shorter paragraph is structurally necessary. The paper should be at least 12 pages (minimum 4000 words) and max 20 pages, including references, or 12000 words.

C. Sub-Literature C

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D. Sub-Literature D

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III. RESEARCH METHOD(S)

The Research Method(s) section must provide a clear, systematic, and reproducible description of the entire research process. Authors must provide sufficient methodological information to allow other researchers to understand, evaluate, and, where possible, replicate the study. The structure of this section may be adapted to the research design; therefore, subsections that do not apply to a particular study may be omitted or replaced with more appropriate methodological components.

A. Research Design

Clearly describe the research approach and design adopted in the study, such as quantitative, qualitative, mixed methods, experimental, survey-based, case study, simulation, computational, machine-learning-based, or other appropriate designs. The selected research design must be

justified according to the research objectives and the nature of the problem being investigated. For studies proposing a new model, algorithm, architecture, framework, or system, authors must clearly explain the overall research workflow and distinguish the proposed method from existing or baseline approaches.

B. Population and Sample

For studies involving human participants, organizations, objects, observations, or other sampling units, describe the target population, sampling technique, sample size, inclusion and exclusion criteria where applicable, and the rationale for determining the sample. The sampling procedure must be described sufficiently to allow readers to assess the representativeness and validity of the study. This subsection may be omitted when the study does not involve population-based sampling, such as certain computational, simulation, or dataset-based studies.

C. Data Sources and Data Collection Techniques

Clearly identify whether the study uses primary data, secondary data, publicly available data, experimental data, sensor-generated data, institutional data, or other data sources. Authors must describe how the data were obtained, including the data collection procedure, period of collection where relevant, instruments or devices used, and any inclusion or exclusion criteria applied during data acquisition. **For primary-data studies**, describe instruments such as questionnaires, interviews, observation protocols, sensors, laboratory equipment, or other data acquisition tools. **For secondary data**, provide sufficient information about the source and conditions under which the data were accessed.

D. Dataset Description and Preparation

For studies using datasets, particularly in machine learning, artificial intelligence, computer vision, natural language processing, data mining, forecasting, or other computational research, authors must provide a sufficiently detailed description of the dataset. At minimum, the manuscript should explain as Table 1. **When using a publicly available dataset**, authors must provide an appropriate citation and, where permitted, information enabling readers to identify or access the original dataset. **When using a private or restricted dataset**, authors must describe its origin and relevant characteristics without disclosing confidential information. **If synthetic or AI-generated data are used**, authors must explicitly disclose how the data were generated, the proportion of synthetic data used, the purpose of their inclusion, and the procedures used to validate their suitability for the study. Dataset descriptions should be sufficiently detailed to support transparency and reproducibility.

Table 1. Dataset descriptions Example

Dataset Information	Description
Dataset Name and Source	State the dataset name, source, and access information where applicable.
Dataset Type	Specify whether the dataset is public, private, institutional, self-collected, or synthetically generated.
Dataset Size	Report the number of records, observations, images, samples, instances, or other relevant units.
Classes / Features	Describe the number and definition of classes, labels, features, attributes, or variables.
Data Characteristics	Summarize the main characteristics and distribution of the data where relevant.
Inclusion / Exclusion Criteria	Explain the criteria used to include or exclude data.
Data Quality Handling	Describe procedures for handling missing values, duplicates, corrupted samples, outliers, or class imbalance.
Data Preparation	Explain preprocessing, normalization, transformation, augmentation, feature engineering, or data-cleaning procedures.
Data Split	Report the strategy and proportion used for training, validation, and testing sets.
Leakage Prevention	Explain procedures used to prevent data leakage, duplicate leakage, or overlap between training and evaluation data.

E. Variables and Operational Definition

Identify and define all relevant variables, features, constructs, indicators, inputs, outputs, or target variables used in the study. **For empirical research**, provide clear operational definitions and describe how each variable was measured. **For computational or machine-learning studies**, explain the input features, target classes or outputs, feature representations, and any feature-selection or feature-extraction procedures used.

F. Measurement Instruments and Validity/Reliability Testing

For studies involving questionnaires, scales, assessment instruments, or other measurement tools, describe the instrument development or adoption process and provide information regarding validity and reliability testing. Where applicable, report the methods and criteria used to evaluate instrument quality, such as content validity, construct validity, Cronbach's alpha, composite reliability, or other appropriate measures. This subsection may be omitted when instrument validity and reliability testing do not apply to the research design.

G. Proposed Method, Model, Algorithm, or System

For studies proposing or evaluating a computational method, algorithm, architecture, framework, or system, clearly describe the proposed approach and its major components. Authors should explain the processing pipeline, model architecture, algorithmic procedure, input-output relationships, and how the proposed method differs from existing methods. Where applicable, report relevant configurations such as model parameters, hyperparameters,

optimization methods, learning rates, batch sizes, number of epochs or iterations, stopping criteria, and other experimental settings to ensure reproducibility.

H. Experimental Setup and Implementation

For experimental and computational studies, provide sufficient information regarding the implementation environment. Where relevant, specify the software, programming language, libraries or frameworks, hardware configuration, computing environment, simulation tools, or experimental equipment used. Authors must also explain the experimental protocol, validation strategy, baseline or comparison methods, and the number of experimental repetitions where applicable. When random processes are involved, use fixed random seeds or other reproducibility measures, and report them when relevant.

I. Data Analysis and Evaluation Techniques

Clearly describe the statistical, qualitative, computational, or analytical techniques used to process and analyze the data. **For statistical studies**, specify the statistical tests, significance criteria, and analytical procedures used. **For qualitative studies**, describe the coding, categorization, thematic analysis, or other interpretive procedures. **For machine-learning or computational studies**, specify the algorithms, validation strategy, baseline models, and evaluation metrics used, such as accuracy, precision, recall, F1-score, AUC, RMSE, MAE, MSE, FID, SSIM, or other metrics appropriate to the research problem. The selected analytical or evaluation methods must be appropriate to the research objectives and should be sufficiently explained.

J. Mathematical Formulas or Models

Mathematical expressions must be created using the **Insert Equation** function in Microsoft Word or an equivalent native equation editor. Equations must not be inserted as screenshots or images. Every equation that is relevant to the research procedure, model, or analysis must be numbered sequentially (**Equation (1)**, **Equation (2)**, **Equation (3)**, etc.) and explicitly referred to in the manuscript.

Each equation must be introduced or subsequently explained in the narrative. All variables, parameters, coefficients, operators, and symbols must be clearly defined upon their first appearance. Authors must also explain the role of the equation in the research rather than presenting the formula without interpretation. For example, see Equation 1.

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

where n represents the number of observations, y_i denotes the actual value, and $\hat{y}_i$ represents the predicted value. Equation (1) is used to measure the prediction error of the evaluated model. All variables, symbols, parameters, and coefficients appearing in an equation must be defined immediately before or after their first appearance. Standard formulas that are adopted from previous studies should be supported by an appropriate citation when necessary.

K. Ethical Considerations

Where applicable, describe ethical approval, informed consent procedures, participant confidentiality, privacy protection, and data-security measures. For studies involving personal, sensitive, medical, biometric, or otherwise restricted data, authors must explain how privacy and data protection requirements were addressed. For publicly available datasets, authors should comply with the dataset's applicable license, terms of use, and ethical restrictions.

IV. RESULT/FINDINGS AND DISCUSSION

A. Result

The Results section must present the research findings clearly, objectively, and systematically, without interpretation or discussion. Authors should provide a logical and coherent description of the outcomes derived from the analysis, aligned with the research objectives and hypotheses. Data should be organized and presented in a manner that highlights key patterns, trends, or relationships. Whenever possible, results should be summarized in a way that facilitates understanding, using both narrative text and appropriate visual aids. Comparative analyses, statistical outputs, or significant findings must be reported accurately, ensuring that the presentation of results remains distinct from their interpretation or implications, which are discussed in the following section.

B. Use of Lists and Footnote

JTIE strongly discourages excessive use of bullet points and numbered lists in the main manuscript. Academic arguments, methodological explanations, findings, and discussions should preferably be presented in coherent paragraph form. Numbering should primarily be used for **sections, subsections, and sub-subsections**. When information consists of numerous comparable items or categories that would otherwise require an extensive list, authors are encouraged to organize the information into a **table** where this improves readability and scholarly presentation.

Footnotes are not permitted in JTIE manuscripts. Essential explanations, qualifications, or supporting information must be incorporated directly into the main text or, where appropriate, presented in an appendix.

C. Paragraph Structure and Appendix

Authors must maintain logical continuity between sentences and paragraphs. As a general rule, each standard paragraph should contain **a minimum of four complete sentences** that collectively develop one principal idea. Single-sentence or excessively short paragraphs should be avoided. An exception may be made for explanatory text immediately following an equation or other situations where a shorter paragraph is structurally necessary.

Appendices are permitted only when the supplementary material is genuinely necessary to support the transparency, reproducibility, or understanding of the study but would substantially interrupt the flow of the main manuscript. Each appendix must be clearly identified and must be **explicitly cited and discussed in the main text**, for example, “*The complete parameter configuration is provided in Appendix A.*” Appendices that are not referenced in the manuscript or that contain unnecessary material may be removed during the editorial process.

D. Figure Preparation

All figures must be numbered consecutively according to their first appearance in the manuscript (**Figure 1, Figure 2, Figure 3, etc.**). Every figure must be explicitly cited and discussed in the main text before or immediately after its presentation, for example: “*The proposed architecture is presented in Figure 1*” or “*As shown in Figure 2, the model demonstrates...*” A figure must not appear as a stand-alone visual element without an accompanying explanation or interpretation in the manuscript.

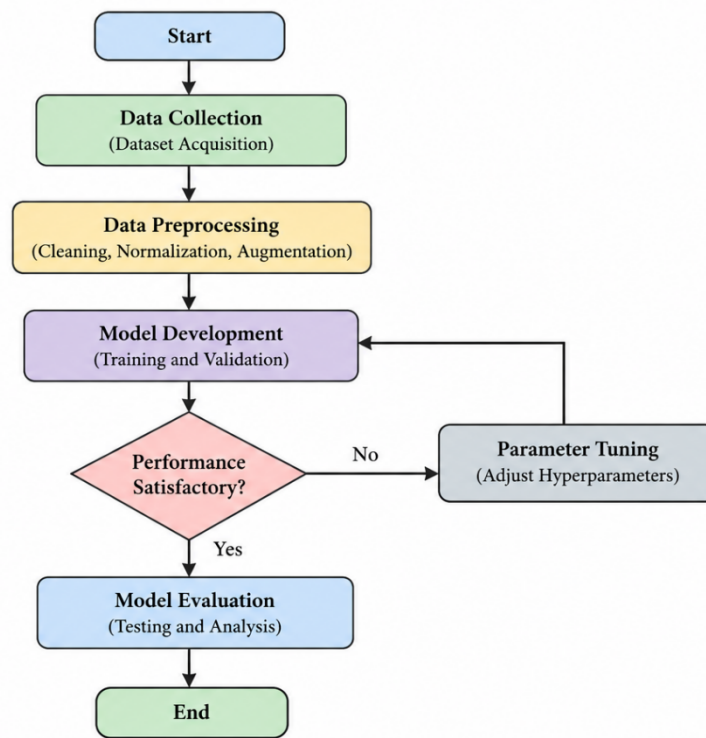


Figure 1. Example of Architecture of the Proposed Classification Model

Figures must be **center-aligned** and provided at sufficient resolution to ensure readability in the published article, preferably at least **300 dpi**. The figure caption must be placed **below the figure**, centered, and written in **bold**. Each caption must be concise but sufficiently descriptive to allow readers to understand the purpose of the figure. All labels, symbols, legends, and abbreviations appearing in a figure must remain clearly legible. See example in Figure 1.

Figures, tables, and equations must never appear as isolated elements. **Every Figure, Table, and Equation must be numbered, explicitly cited in the main text, and sufficiently discussed or explained.** Their numbering must follow the order of first appearance in the manuscript. Authors must ensure that each visual or mathematical element contributes directly to the scholarly narrative and is not included merely for decorative or supplementary purposes.

E. Table Preparation and Presentation

Tables must be numbered consecutively according to their first appearance (**Table 1, Table 2, Table 3, etc.**). Every table must be explicitly cited and discussed in the narrative text. Authors should not merely direct readers to a table; the manuscript must explain the principal information, pattern, comparison, or finding conveyed by the table. For example: “*The comparative performance of the evaluated models is summarized in Table 2*”, followed by an interpretation of the relevant results. Tables must not appear as stand-alone elements without discussion in the text.

Each table must have a clear and informative caption. Tables must be **center-aligned**, use **Times New Roman, 10 pt**, and contain **no background colors or decorative formatting**. Table formatting should use simple **single-line borders** and maintain a clean academic appearance. Paragraph spacing within tables must be set to **0 pt before and 0 pt after, with space 1.0 for the column**. Excessive vertical spacing, unnecessary blank rows, and decorative elements must be avoided. See the table presentation in Table 1 or Table 2.

Table 2. An example of Table preparation

Sample Title	Sample Title	Sample Title
Content	Content	Content
Content	Content	Content

F. Citation and Reference Requirements

JTIE uses the **IEEE citation and reference style**. In-text citations must be indicated using sequential numbers in square brackets, such as [1], [2], [3]–[5], according to the order in which the sources first appear in the manuscript. The reference list must therefore be arranged according to citation order and **must not be alphabetically ordered**. Author–date citation formats are not permitted.

A regular research article must contain **at least 25 references**. At least **80% of the references should consist of articles published in reputable international scientific journals** relevant to the manuscript. Books and conference proceedings are permitted when academically necessary but should collectively constitute **no more than 10%** of the references. For **systematic literature reviews (SLR), literature reviews, bibliometric studies, and comparable review-based manuscripts**, a minimum of **40 references** is required.

Authors are required to use reference-management software, such as **Mendeley Reference Manager or Zotero**, to maintain citation consistency and minimize bibliographic errors. Before submission, authors must verify the completeness and accuracy of all bibliographic metadata, including **author name(s), article or document title, publication year, journal or publication title, volume, issue number, page range or article number, publisher where applicable, and DOI or arXiv identifier where available**. Particular attention must be given to the correct capitalization of titles and other bibliographic elements according to IEEE conventions. Every source listed in the References section must be cited in the manuscript, and every in-text citation must have a corresponding reference entry.

1. Citation Sample

Deep learning has demonstrated substantial performance improvements in visual classification tasks [1], [2]. Similar observations have been reported across different datasets [3], [4], [5], [6], [7], [8], while several studies have emphasized challenges related to model generalizability [7], [9], [10], [11], [12].

G. Discussion

The Discussion must provide a **critical interpretation of the findings rather than repeat or restate the Results section**. Authors should explain what the findings mean, why the observed results may have occurred, and how they address the research objectives or research questions. Numerical results already reported in tables, figures, or the Results section should not be unnecessarily repeated unless required to support a specific analytical argument.

The principal findings must be systematically compared with relevant previous studies and literature introduced earlier in the manuscript. Authors should identify whether the present findings **support, extend, refine, contradict, or differ from previous research** and provide academically justified explanations for such relationships. The discussion should consequently establish the contribution of the study in relation to the existing body of knowledge rather than functioning as another presentation of results.

Where relevant, authors should discuss theoretical, methodological, and practical implications arising from the findings. The Discussion must also explicitly acknowledge the **limitations of the study** and explain how these limitations affect the interpretation or generalizability of the findings. Based on these limitations and unresolved research issues, authors should provide specific and realistic **recommendations or directions for future research**.

V. CONCLUSION AND RECOMMENDATION

The conclusion is stated briefly, with the ability to address research aims or issues by demonstrating research findings or testing research hypotheses, **without** repeating the discussion. Critically, rationally, and truthfully, based on the facts of the current study results, and with caution, if there are efforts at generalization, conclusions are written. The findings and recommendations section is written in paragraph format, with no numbering or bullet points. In this section, it is also acceptable for the author to provide practical comments or recommendations based on the findings of the research. Similarly, the authors are highly encouraged to share reviews of the study's limitations and suggestions for further research

ACKNOWLEDGEMENT (if any)

This section is available for authors to express their appreciation to those who fund research, support facilities, or assist with article review. If this article is part of a

thesis/thesis/dissertation/conference paper/research results, this section may also be used to provide statements or explanations.

DATA AVAILABILITY

Authors must provide a **Data Availability Statement** explaining whether and how the data supporting the findings of the study can be accessed. For publicly available data, provide the repository or dataset name and persistent identifier (e.g., DOI) where available. For restricted or confidential data, clearly state the reason for the access limitation. If data sharing does not apply to the study, this must also be stated.

Example:

The data supporting the findings of this study are available from [repository/source] at [DOI or persistent identifier].

or

The data are available from the corresponding author upon reasonable request.

or

Data sharing does not apply to this article because no new datasets were generated or analyzed.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES

Authors must disclose the use of **generative AI or AI-assisted technologies** during the preparation of the manuscript. The statement should identify the AI tool used and briefly describe its purpose, such as language improvement, translation, coding assistance, data processing, or other supporting activities. Authors remain fully responsible for the **accuracy, originality, integrity, citations, and final content** of the manuscript. AI tools must not be listed as authors or co-authors.

The use of AI as an **object, method, algorithm, or analytical component of the research itself** should be described in the Research Method(s) section rather than only in this declaration.

Example:

During the preparation of this manuscript, the authors used [tool name] for [purpose]. The authors reviewed and edited the generated output and take full responsibility for the content of the manuscript.

or

The authors declare that no generative AI or AI-assisted technologies were used in the preparation of this manuscript.

AUTHOR CONTRIBUTIONS (CRediT)

Author contributions must be reported using the **CRediT (Contributor Roles Taxonomy)**. Each author's contribution should be identified using the applicable roles. Only roles that reflect the author's actual contribution should be included. Multiple authors may share the same role, and one author may have multiple roles.

The recognized CRediT roles include: **Conceptualization, Methodology, Software, Validation, Formal Analysis, Investigation, Resources, Data Curation, Writing – Original Draft, Writing – Review & Editing, Visualization, Supervision, Project Administration, and Funding Acquisition.**

Example:

Author A: Conceptualization, Methodology, Formal Analysis, Writing – Original Draft. Author B: Software, Validation, Data Curation, Visualization. Author C: Supervision, Writing – Review & Editing, Project Administration. All authors have read and approved the final manuscript.

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