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REVIEWER'S REPORT

Manuscript No.: **IJAR-52591** Date: **2/07/2025**

Title : Comparative Study of Deep Learning Models for Human Activity Recognition

Recommendation:
Accept as it is .....
Accept after minor revision (√)
Accept after major revision .....
Do not accept (*Reasons below*) .....

Rating	Excel.	Good	Fair	Poor
Originality		√		
Techn. Quality		√		
Clarity		√		
Significance		√		

Reviewer Name: **Date:**

Yuniana Cahyaningrum, S.Kom., M.Kom. **2/07/2025**

Reviewer's Comment for Publication.

This manuscript presents a systematic comparative analysis of five different deep learning architectures: basic Multi-Layer Perceptron (MLP), 1D Convolutional Neural Network (1D-CNN), Long Short Term Memory (LSTM) network, hybrid CNN-LSTM model, and Transformer-based model. The paper also has findings by revealing that although Transformer achieves the highest F1 score (0.931), its large computational cost makes it less suitable for real-time edge applications. With some improvements (especially clarification of sample size, statistical reporting, and language refinement), this work could make a valuable contribution to IJAR readers. Therefore, I recommend accepting it after minor revisions.

Detailed Reviewer's Report

Strengths

1. Relevant topic
   HAR systems rely on hand-crafted feature engineering combined with traditional machine learning classifiers such as Support Vector Machines (SVM). The advent of deep learning has revolutionized the field by enabling end-to-end learning, where models automatically extract hierarchical features directly from raw sensor data.
2. Clear research aim
   The aim of this study is a holistic comparison that evaluates deep learning architectures not only on their predictive power but also on their operational efficiency.
3. Sound instruments
   Human Activity Recognition (HAR) inference must occur in real-time on resource-constrained edge devices with limited battery life and processing power.

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4. Practical implications
   Architectures such as Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN) have become the de facto standard, consistently achieving state-of-the-art results. However, pushing the limits of accuracy often results in increasingly complex and computationally expensive models.

5. Ethical transparency
   This paper contributed A model that achieves 99% accuracy but drains a smartphone battery within an hour is not practical..

Weaknesses

1. Incomplete statistics
   Statistics can be supplemented and added with units from the table to make them clearer.

2. Table and Graph
   It would be better if the images in the graph could be explained and displayed.

3. Language polish
   Minor grammar slips distract from the argument; a quick copy-edit would fix this.

4. Reference consistency
   A few URLs are incomplete and year formats vary. Aligning all entries with APA 7 will enhance professionalism. The reference use must be up to date (Last 5 years). There are several references that are more than five years old.