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#### **REVIEWER'S REPORT**

Manuscript No.: IJAR-51114

Date: 19-04-2025

# Title: Design and Simulation of IoT-Based Intelligent Home Automation Systems Using MATLAB Simulink and Python Integration

Recommendation:	Rating	Excel.	Good	Fair	Poor
Accept as it is <b>YES</b> Accept after minor revision Accept after major revision Do not accept ( <i>Reasons below</i> )	Originality				
	Techn. Quality				
	Clarity				
	Significance				

#### Reviewer's Name: Mr Bilal Mir

**Reviewer's Decision about Paper:** 

**Recommended for Publication.** 

**Comments** (Use additional pages, if required)

### **Reviewer's Comment / Report**

#### **General Evaluation:**

This paper presents a thorough and contemporary exploration of IoT-based smart home systems, emphasizing simulation and communication using Python and the MQTT protocol. The integration of MATLAB Simulink and Python provides a strong dual-platform foundation for both visualization and real-time interaction. The study is conceptually robust and well-structured, offering valuable insights into IoT frameworks, smart device communication, and system automation in home environments.

#### **Abstract and Keywords:**

The abstract clearly summarizes the scope and objectives of the study. It highlights the integration of simulated IoT devices using Python and MQTT, and the interaction between devices and a centralized controller. The mention of real-time simulation, environmental interaction, and architectural principles is well-placed. The keywords are relevant, although slightly limited; they still point to the central components of the paper.

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#### Introduction:

The introduction effectively contextualizes the need for smart home systems and their reliance on IoT frameworks. It establishes the increasing demand for intelligent automation, energy efficiency, and enhanced home security. The narrative draws attention to Python's utility in IoT system development and sets a clear justification for the use of MQTT, given its efficiency and suitability for low-bandwidth, scalable communication.

The challenges of scalability, security, and interoperability are acknowledged, adding depth to the problem formulation. The motivation behind using Python and Simulink for simulation is well-articulated, aligning with practical development considerations in academic and industrial contexts.

#### **Technical Content and Conceptual Framework:**

The simulation model as described involves smart lights, cameras, and thermostats operating via MQTT protocol. The conceptual clarity regarding the use of a central controller and multiple MQTT clients indicates a solid understanding of distributed system architecture. The choice of MQTT, justified by its low overhead and suitability for IoT applications, is technically sound and appropriate.

The incorporation of Python's Paho MQTT library underscores the study's alignment with industrystandard tools. The description of dynamic device behavior, environmental responsiveness, and bidirectional communication through MQTT adds operational realism to the simulation.

#### System Functionality and Real-World Scenarios:

The paper outlines key functionalities such as automatic lighting, temperature regulation, and motion detection. These use cases are relevant and representative of common smart home needs. Their simulation in the study provides practical validation of the theoretical architecture proposed.

The emphasis on real-time communication and control suggests that latency, reliability, and message handling efficiency are considered. Although specific performance metrics are not discussed in the excerpt, the structural overview provides assurance of systematic design.

#### Language and Clarity:

The language used throughout the paper is academic, precise, and accessible. Technical terms are appropriately introduced and used. The transitions between concepts are smooth, and the structure of the introduction supports a logical progression into deeper technical discussions.

#### **Conclusion and Relevance:**

The study makes a relevant contribution to the fields of home automation, IoT system design, and simulation modeling. By combining two powerful platforms—MATLAB Simulink and Python—the research bridges the gap between system modeling and practical implementation. The potential for future extension into cloud services and machine learning applications is a forward-looking consideration that enhances the study's value.

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#### **Overall Assessment:**

This is a well-conceived and effectively presented study on intelligent home automation using IoT principles. The integration of MQTT for device communication and the use of Python and Simulink for simulation illustrate a solid methodological approach. The focus on scalability, real-time response, and security positions the work as a relevant and timely contribution to smart home technology research.