AHCS: Advanced Health Care System for Critical Care Integrated with AI and Fog Computing in IoT Environments

Mohd Asifuddola¹, Mumtaz Ahmed², Zahir Abbas Khan³, MohdAhsan Siddiqui⁴, Liyaqat Nazir⁵

 ¹Department of Electronics Engineering, Z.H.C.E.T, Aligarh Muslim University, India
²Department of Computer Engineering, Jamia Millia Islamia, New Delhi, India Corresponding author Email: mahmed1@jmi.ac.in
³Polytechnic, Bangalore, Karnataka, Maulana Azad National Urdu University, India.
⁴Polytechnic, Darbhanga, Bihar, Maulana Azad National Urdu University, India.
⁵Department of E.C.E, Islamic University of Science Technology, Awantipora, J & K, India.

This paper employs the Pure Edge simulator to analyze the effectiveness of the edge and cloud computing structures addressing task completion time and resource consumption. In the simulation, 'TRADE OFF' and 'ROUND ROBIN' algorithms are used to compare the 'EDGE AND CLOUD' and 'CLOUD ONLY' orchestration architectures with respect to a number of edge devices. The proposed 'EDGE AND CLOUD' architecture achieves a balance of the computational load and has a relatively healthy average execution delay and an improved task success rate. In contrast, the 'CLOUD ONLY', where all task processing resides in the cloud, has more task failures because of latency, even if it provides total immediacy of processing and storage. A comprehensive analysis and comparison have been done, which suggests that hybrid architectures have significant potential to enhance feasibility and efficiency in distributed computing systems.

Keywords: Smart Healthcare, IoT, Machine Learning, Intelligent System.

1. Introduction

Using a cross-disciplinary approach with the help of modern technologies that can improve patient outcomes as the centerpiece, an advanced healthcare system for patients in critical care can be asserted. Such an advanced healthcare system for patients in critical care is defined by applying the latest medical technologies, AI and IoT, for effective patient care and data collection and analysis. In such systems, passive patient monitoring is made possible through IoT-based medical devices that acquire and send significant patient health parameters to AI

Nanotechnology Perceptions 20 No. S14 (2024) 184-213