**PERANCANGAN SISTEM PEMANTAUAN RUANG SERVER KAMPUS 4 SIDOARJO POLITEKNIK NEGERI JEMBER BERBASIS 3D *HOME ASSISTANT* MENGGUNAKAN *INTERNET OF THINGS* DENGAN METODE *FUZZY MAMDANI***

Mochammad Rifky Ulil Albab S.T., M.Tr.T as chief counsoler

**Muhammad Andra Kusuma Ramadhan**
***Study Program of Informatics Enggineering***
***Majoring in Information Technology***
Program Studi Teknik Informatika
Jurusan Teknologi Informasi

## *ABSTRACT*

*In the era of digital transformation, server rooms play a vital role as data processing and storage centers for higher education institutions such as Politeknik Negeri Jember. Poorly monitored environmental conditions in server rooms can lead to service disruptions, hardware failures, and significant data loss. This study aims to design and implement a server room monitoring system at Campus 4 Sidoarjo, based on the Internet of Things (IoT), with 3D visualization using the Home Assistant platform and automated decision-making using the Fuzzy Mamdani method. The system incorporates DHT22 sensors to measure temperature and humidity, PIR sensors to detect motion, an ESP32-CAM for visual monitoring, and an ESP32 NodeMCU as the central controller. Data is transmitted via the MQTT protocol to a local server, analyzed using fuzzy logic, and displayed in real-time through the Home Assistant interface. The defuzzification results determine the alert level (safe, warning, danger), which triggers notifications and buzzer control as an early warning mechanism.*