PROBLEM STATEMENT

WHAT

Explore the feasibility and benefits of using WLAN edge computing and evaluate how edge computing can improve performance by processing data closer to its source.

WHY

WLAN edge computing overcome limitations associated with traditional cloud computing models. It offers reduced latency, improved bandwidth utilization

HOW

Analyzing the performance, latency by developing individual apps for Surveillance video processing and Smart home application and deploying them using WLAN edge computer

OBJECTIVES

Explore *related literature* on literature on WLAN Edge **EXPLORE** computing

Design applications for surveillance video processing and Smart **DESIGN** home with wireless LAN edge computing

Develop above critical applications and analyze performance metrics between Cloud and Edge Computing facilities. Develop **DEVELOP** a front end for access those applications

Demonstrate and evaluate the *performance of proposed* **EVALUATE solution** in real-world application scenarios

SYSTEM OVERVIEW

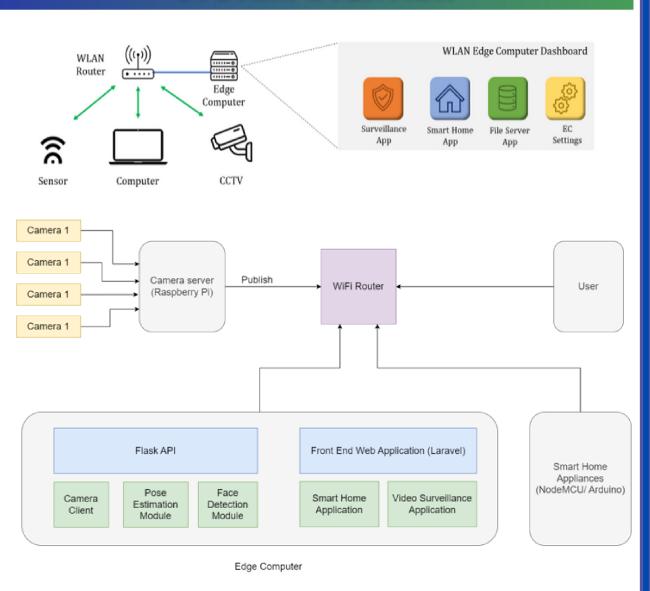


Fig 1 - System Overview

RESULTS

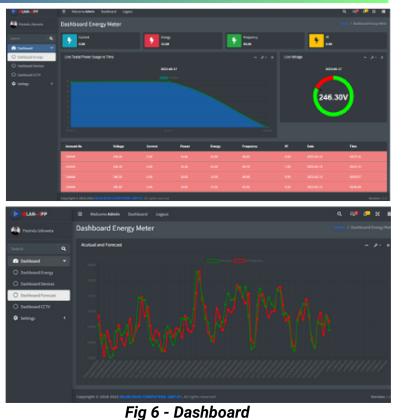
Model Scenario

- Pose detection model accuracy -86%
- Latency comparison between edge and cloud using pose detection model
- Heroku link- https://surveilancecharukaj.herokuapp.com/predict

Cloud (Heroku)	Edge
3.245677s	2.889977s
4.556533s	3.778009s
3.134457s	2.009932s
2.789334s	1.899303s

Fig 5 - Latency Comparison

Smart Home Dashboard and energy prediction



CONCLUSION & FUTURE WORK

- WLAN edge computing provides benefits such as improved performance and reduced latency through processing data and running applications closer to end-users.
- It increases reliability by providing a backup option in case of network outages and enhances security by processing sensitive information locally.
- WLAN edge computing provides a more efficient and secure solution for surveillance video processing and smart home applications...

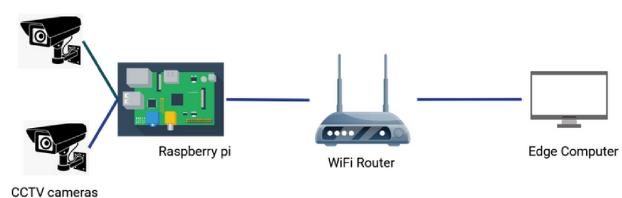
METHODOLOGY

Surveillance video application

Surveillance video application has two main parts

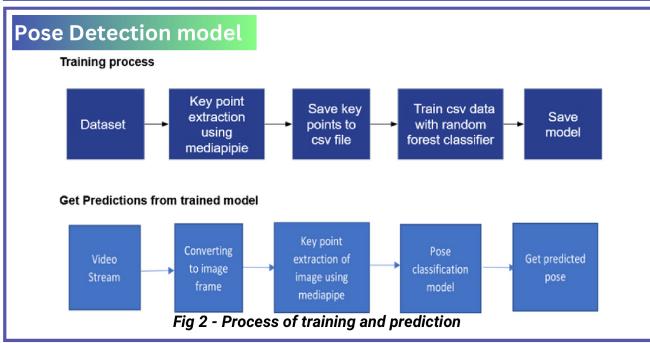
- Threatful pose detection such as climbing, gun shooting, push, pull and run
- Face recognition

Processing real time video feed to detect poses and faces

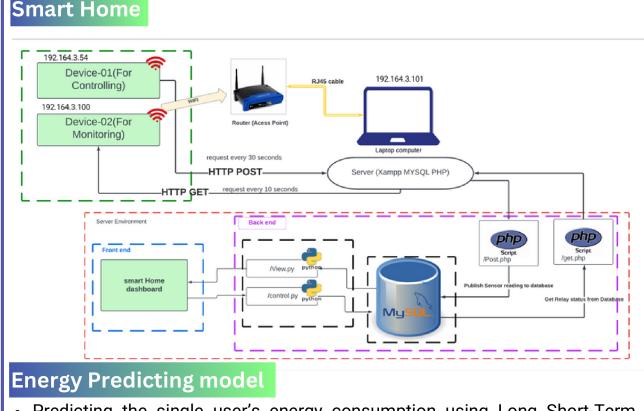


Smart home application

Monitoring and controlling smart home devices and energy prediction



Fcae Detection model Process of registering a new face Training the captured Getting the videocapture frames using frontal_face face as a naar cascade classifier of a person known face Face Recognition Process Displaying the Recognizingthe captured corresponding name or frames using frontal_face videocapture 'Unknown' for an haar cascade classifier unrecognized face Fig 3- Process of face detection



- Predicting the single user's energy consumption using Long Short-Term Memory (LSTM).
- Detecting Anomalies in the usage patterns according to given threshold



Fig 4- Energy monitoring and appliances controlling devices

REFERENCES

[1] Kim, J.-W. et al. (2023) Human pose estimation using MediaPipe pose and optimization method based on a humanoid model, MDPI. Available at: https://www.mdpi.com/2076-3417/13/4/2700 (Accessed: 25 June 2023)

[2]Mahjoub, S. et al. (2022) Predicting energy consumption using LSTM, multi-layer MDPI. gru and drop-gru neural networks, Available https://www.mdpi.com/1424-8220/22/11/4062 (Accessed: 25 June 2023)

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