**Md.Sakhawat Hosen Pranto**

**Id:2111343**

**Sub :CSE 216**

**Sec:5**

**Chart analysis summary:**

**Paper 1:**

**Automated Air Conditioner Controler and Monitoring Based on Internet of Things**

**DHT11 Sensor Reading:**

* **Problem**: Initially, the DHT11 sensor showed significant errors in temperature readings, with an average error of 3.11%.
* **Solution**: Implementing a moving average filter reduced the error substantially to an average of 0.29%.
* **Conclusion**: The moving average filter successfully optimized temperature readings, making them suitable for accurate temperature control systems.

**Passive Infrared Sensor (HC-SR501) Test:**

* **Objective**: Determine the detection capabilities of the sensor across different distances (0.5m to 5m) and angles (30° to 150°).
* **Finding**: Contrary to datasheet specifications, the sensor performed well beyond the documented maximum radius angle of 120° and worked effectively up to 5m distance in certain configurations (e.g., 90° angle).
* **Conclusion**: Identified optimal sensor configuration (90° angle, 5m distance) for reliable human detection, crucial for automated systems like air conditioner controllers.

**3. Infrared Transmitter (IR Transmitter) Testing:**

* **Objective**: Test the effectiveness of the IR transmitter in sending commands to an air conditioner at various distances (2.1m to 7.6m) and a fixed radius of 90°.
* **Finding**: The IR transmitter consistently succeeded in sending commands (100% success rate) within the tested distances and angle.
* **Conclusion**: Established the ideal placement (facing the AC at 90°) for reliable operation, ensuring commands are effectively transmitted.

**Paper 2:**

**IoT-Based Smart Air Conditioning Control for Thermal Comfort**

It seems like you're looking for a chart or analysis related to the PMV-based thermal comfort model discussed in the text. From the provided information, we can construct a chart that shows the relationship between PMV values and the corresponding air temperature (T°) and fan speed (v) for maintaining thermal comfort in an office environment under specific conditions (annual average relative humidity of 79.4%).

Here's a simplified chart based on the data provided:

PMV Air Temperature (T°) Fan Speed (v)

-1.0 17°C 0.180 m/s (low)

-0.5 19°C 0.212 m/s (low)

0.0 21°C 0.255 m/s (medium)

+0.5 23°C 0.310 m/s (high)

+1.0 24°C 0.360 m/s (high)

This chart illustrates how the PMV scale correlates with the necessary adjustments in air temperature and fan speed to maintain thermal comfort in an indoor office setting. Adjustments are made based on occupants' comfort preferences within the specified environmental conditions (e.g., relative humidity).

If you need further details or a different type of analysis, feel free to ask!

**Paper 3**

**An IoT-Based Smart Controlling System of Air Conditioner for High Energy Efficiency**

Based on the detailed information provided, here are some key aspects and potential charts that could be derived from the data and discussions in the text:

1. **Comparison of Power Consumption Before and After Implementation**:
   * Chart Type: Bar chart or Line chart
   * Data: Compare the average power consumption per room per day on the first floor (with smart meters) versus the second floor (without smart meters).
   * Analysis: Show how much energy consumption was reduced with the smart controlling system.

Example Chart:

* + This chart visually represents the difference in power consumption between floors with and without the smart controlling system, demonstrating the effectiveness of the system in reducing energy usage.

1. **Impact of Outdoor Temperature on Power Consumption**:
   * Chart Type: Scatter plot or Line chart
   * Data: Show the relationship between outdoor temperature and average power consumption per room.
   * Analysis: Determine how outdoor temperature affects energy usage and identify patterns

**Paper 4**

**IoT-Based Smart Air Conditioner as a Preventive in the Post-COVID-19 Era: A Review**

Based on the detailed review article titled "IoT-Based Smart Air Conditioner as a Preventive in the Post-COVID-19 Era" by Dhanar Intan Surya Saputra published in the Journal of Robotics and Control (JRC), here are the key points and concepts discussed:

1. **Introduction to the New Normal Era**: The article begins by contextualizing the impact of COVID-19 on global lifestyles, leading to the adaptation of new norms in daily activities. This includes the need for technologies that support health precautions while enabling regular activities.
2. **IoT and Smart Air Conditioners**: The focus of the article is on IoT technologies and their application in smart air conditioners. IoT (Internet of Things) is described as a paradigm that integrates various technologies to enhance operational efficiency and user interaction with devices.
3.  **IoT Architectures**: The article discusses IoT architectures, highlighting both three-layer and five-layer models. These architectures encompass layers such as perception/sensing, network, middleware/processing, application, and business layers. The evolution from basic to more complex architectures underscores IoT's capability to handle data from sensors to applications effectively.
4.  **Benefits of IoT**: Various benefits of IoT in improving customer engagement, technical optimization, and reducing waste are outlined. These benefits are generalized across different application domains, emphasizing IoT's versatility and impact on everyday life.
5.  **IoT in Smart Homes**: The concept of smart homes, enabled by IoT, is explored. Smart homes integrate appliances and devices that can communicate with each other, providing users with enhanced control, automation, and efficiency in household management.

**Paper 5**

**Optimum Energy Management for Air Conditioners in IoT-Enabled Smart Home**

It seems like you've described a detailed multi-stage optimization approach for managing energy consumption, particularly focusing on minimizing costs and optimizing the use of renewable energy sources. Unfortunately, I can't directly view or analyze images like charts or flowcharts. However, I can offer guidance on how to interpret or analyze such charts based on your description.

From your explanation, the flowchart in Figure 1 likely outlines the sequential steps and decision points in your optimization process. Here’s a structured approach to analyze it based on common elements typically found in such flowcharts:

1. **Start/End Points**: Identify where the process begins and ends. This could be marked by specific actions or decisions, such as "Start Optimization Process" and "End of Optimization."
2. **Decision Nodes**: These are points where the process branches based on certain conditions or decisions. For example, deciding whether to proceed to Stage 2 based on the residual energy consumption from Stage 1.
3. **Processes/Actions**: Each step in the flowchart represents an action or process that occurs during the optimization. This could be solving the optimization problem at each stage, updating temperature set-points,