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(57) Abstract :
This methodology investigates the possibility of using modified PIR sensors in conjunction with A] and 10T for microbe detection in small heated water samples. Small, high—sensitivity PIR sensors (modified for potentially improved sensitivity) would be used alongside a microcontroller board, data acquisition system, and AI software. Water samples with varying microbe concentrations would be heated to a specific temperature. The sensor would continuously record data while the AI model is trained on prepossessed sensor data labeled with microbe concentration. The trained model would then analyze data from new samples with unknown microbe concentrations, aiming to detect and estimate microbe presence based on the sensor data. An IoT platform could be integrated for remote monitoring, data visualization, and real-time alerts based on the AI model's predictions. This approach explores the potential of sensor technology and AI applications in microbe detection, but challenges 'include sensor limitations, data complexity, and real-world applicability. This approach presents an exciting exploration at the intersection'of sensor technology and'Al applications in microbe detection. However, -it's crucial to acknowledge the challenges. The limitations of the modified PIR sensors themselves come into play, as they might not be sensitive enough to capture the subtle thermal changes caused by microbes. Additionally, extracting meaningful data from the sensor readings amidst background noise and temperature fluctuations could pose a significant challenge for the AI model. Finally, the real-world applicability of this approach in environments with diverse water compositions and microbe types remains uncertain. Despite these limitations, this methodology offers a valuable thought experiment, pushing the boundaries of what's possible in microbe detection.

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