CHAPTER-6
EXPERIMENTAL RESULTS

The experimental results of an IoT-integrated machine learning number plate recognition system for authorized access provide valuable insights into its performance. One key finding is the system's high accuracy in recognizing characters, achieving a success rate of 95% under daylight conditions. It shows a slight dip to 90% in low-light scenarios and maintains a robust 93% accuracy when detecting number plates at challenging angles of up to 45 degrees. Processing speed is another highlight, with image capture being almost instantaneous at less than a second, while preprocessing takes approximately 2-3 seconds, and character recognition completes within 1-2 seconds. This efficiency ensures the system responds quickly to incoming vehicles, minimizing delays.

The reliability of the system is impressive, with accuracy rates of 88% for detecting vehicles within the range of 1.5 to 3 meters. Additionally, when compared to manual methods, the system exhibits an error margin of less than 5% in occupancy tracking tests. These results demonstrate the system's ability to operate seamlessly in real-world conditions, making it a viable solution for secure and automated access control. Overall, the findings underscore the system's ability to integrate hardware and machine learning models effectively, delivering accurate and swift performance while ensuring reliability across various scenarios.