

The Dual Core of IOT: Hardware Meets Information Systems

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Abstract: *The Internet of Things (IoT) integrates the physical and digital worlds, blending hardware components such as sensors, actuators, and microcontrollers with robust information systems involving cloud computing, machine learning, and cybersecurity. This fusion not only enables seamless data acquisition and processing but also fosters predictive analytics and decision-making. This paper explores the symbiotic relationship between IoT hardware and information systems, providing a comprehensive understanding of their interdependence. Through a detailed literature survey, methodological insights, and an analysis of current trends, this research highlights how the convergence of these domains is transforming industries. The findings aim to provide a framework for future advancements in IoT ecosystems.*

Keywords:

- **Sensors:** Devices that detect and respond to physical inputs such as light, heat, motion, or pressure, converting them into data.
- **Actuators:** Mechanisms that convert electrical signals into physical actions, enabling real-world interaction.
- **Cloud Computing:** A technology that provides scalable storage and computational power, facilitating IoT data management.
- **Machine Learning:** A subset of artificial intelligence enabling systems to learn and improve from IoT data without explicit programming.
- **Predictive Analytics:** Data-driven techniques that forecast future events based on historical IoT data patterns.
- **Cybersecurity:** Practices and technologies that protect IoT systems from unauthorized access and cyber threats.