

# Smart Home Automation Using IoT and AI

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**Abstract:** This research dives into the integration of Artificial Intelligence (AI) and the Internet of Things (IoT) into our living spaces, specifically in Smart Home Automation. We set out to understand this transformative technology's benefits, challenges, and ethics. Through a systematic review of sources (2023-2025), a clear duality emerged: The biggest benefits of AI-driven homes—like hyper-personalization, energy efficiency, and predictive safety—are deeply tied to their biggest risks. We found the main challenges are technical (interoperability), security-based (IoT botnets), and privacy-related (data surveillance). The paper also confronts the core ethical problems: loss of user autonomy, continuous surveillance, and data ownership. Our conclusion? A "set it and forget it" model isn't the answer. The future lies in a Human-in-the-Loop model, where local processing (Edge AI) and robust security protocols are the most valuable parts of the process. This paper frames these findings to help navigate this new landscape responsibly.

**Keywords:** Smart Home Automation, Internet of Things (IoT), Edge AI, Energy Management, Data Privacy, Predictive Maintenance, Systematic Literature Review