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EXPLORING LIGHTWEIGHT MACHINE LEARNING MODELS FOR PERSONAL INTERNET OF THINGS (IOT) DEVICE SECURITY

Abstract: The Internet of Things (IoT) has rapidly transformed home automation systems, offering convenience, efficiency, and enhanced control over household devices. From smart thermostats and lighting systems to security cameras and refrigerators, IoT technology enables users to monitor and control various aspects of their homes remotely. However, the widespread adoption of IoT in home automation systems brings with it a complex array of social implications. This paper examines the social impact of IoT technology in residential settings, focusing on privacy, security, and the potential for social inequalities. It explores how IoT-enabled devices collect vast amounts of personal data and the risks this poses to individual privacy, including the potential for unauthorized access, data breaches, and surveillance. Furthermore, the study analyses the security vulnerabilities inherent in these systems and the potential for cyberattacks, which could compromise users' safety and autonomy. The paper also delves into the social divide created by the unequal access to IoT technologies, examining how socio-economic factors may limit certain demographic groups from benefiting from smart home innovations. Additionally, the impact of IoT on social relationships, particularly the role of automation in reducing human interaction and fostering dependency on technology, is discussed. Through this analysis, the paper provides a comprehensive understanding of the broader societal challenges posed by IoT in home automation systems, offering insights into ethical, policy, and regulatory considerations that need to be addressed for a more equitable and secure IoT-enabled future.

Keywords: IoT, Home Automation, Privacy, Security, Social Inequality, Technology Dependency

Biography: Chukwuebuka Akwiwu-Uzoma is a data leader with expertise in AI, data engineering, cloud computing, and security, backed by an MSc in Data Science and Engineering from the University of Dundee. Currently spearheading Power Analysis Data Platform development in the Semiconductor industry, where he optimizes energy efficiency for mobile, automotive, and server computing systems.

A researcher and thought leader in sustainable computing, Chukwuebuka transforms complex data infrastructures into actionable business insights. He is a sought-after speaker and mentor, partnering with organizations like the Global Mentorship Initiative to develop the next generation of data leaders.

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Biography: Yomi Omotoso is a Senior Software Engineer and Technical Leader with over six years of experience in developing high-performance, scalable applications. Specialising in PHP, JavaScript, and blockchain, he has built a strong reputation in fintech, e-commerce, and logistics. As a member of the MBCS and an MBA holder in E-commerce, Yomi combines technical depth with strategic insights, excelling in cloud architecture, API development, and system optimisation. His work focuses on managing and developing robust, scalable technologies designed to support billions of users, particularly in payment solutions. Additionally, he is the Convener of the UK Tech Career Summit, a platform through which he passionately guides professionals in navigating the evolving tech landscape.

Yomi is also an ADPList Mentor and sought-after speaker, frequently addressing topics in EdTech, FinTech, and value-added service (VAS) products. Known for his detail-oriented approach and effective team coordination, he prioritizes customer satisfaction and aligns his technical projects with overarching business goals. His leadership style ensures the successful deployment of solutions that can handle millions of daily transactions, reflecting his commitment to excellence in both technical delivery and user-centric innovation.

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