

Research Opportunities in Human Life Applications based on Artificial Intelligence, Machine Learning & Internet of Things using Number Theory

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Abstract: *The integration of Artificial Intelligence (AI), Machine Learning (ML), and the Internet of Things (IoT) is transforming human life through smart healthcare, intelligent environments, and personalized services. Number theory, a fundamental area of mathematics, offers untapped potential to enhance these technologies, especially in areas requiring data security, optimization, and efficient computation. Cryptographic techniques based on number theory, such as modular arithmetic and prime factorization, are vital for securing IoT communications and protecting sensitive AI-driven data. Moreover, number-theoretic methods can improve algorithmic performance in ML by enabling better data encoding, feature selection, and noise reduction. This intersection opens promising research opportunities for developing secure, efficient, and scalable solutions in real-time human life applications. Future directions include lightweight cryptographic protocols for IoT, number-theoretic approaches to anomaly detection, and secure federated learning systems. Exploring these avenues could lead to innovative, trustworthy, and human-centered AI and IoT technologies.*

Keywords: Artificial Intelligence (AI) , Human Life Applications, Internet of Things (IoT), Machine Learning (ML), Number Theory (NT) & Software Tools

