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EDITORIAL
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Editorial: AI-Powered IoT for Intelligent Systems and Smart Applications

Ahmed Zoha[1]*, *Junaid Qadir*[2] and *Qammer H. Abbasi*[1]

[1]James Watt School of Engineering, University of Glasgow, Glasgow, United Kingdom, [2]Department of Computer Science and Engineering, Qatar University, Doha, Qatar

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Editorial on the Research Topic

AI-powered IoT for Intelligent Systems and Smart Applications

This Research Topic titled *"AI-powered IoT for Intelligent Systems and Smart Applications"* brings together different contributions that highlight innovative uses of artificial intelligence (AI) for healthcare monitoring, next-generation transportation systems, and social pulse monitoring. Using design-driven innovation, the authors proposed various solutions to the challenges involved in implementing AI-driven systems. These include addressing the quality-of-service requirements (latency, bandwidth, and delay), hybrid mechanisms to provide reliable estimation of healthcare conditions, as well as mechanisms to support improved textual analysis.

Three articles have been chosen for this topic after a rigorous review process. Each submitted paper was reviewed by at least two expert reviewers. The accepted papers present a snapshot of how AI-powered IoT is contributing towards the development of intelligent systems and smart applications.

The first article "*A review and comparison of the state-of-the-art techniques for atrial fibrillation detection and skin hydration*" by Liaqat et al. examines the state-of-the-art of atrial fibrillation (AF) techniques that embed emerging AI models for proactive and automatic detection of AF in its earliest possible stages. Moreover, the study suggests that an understanding of skin conductance responses and hydration levels through systematic analysis may provide information regarding the relationship between skin conductance data and multiple health conditions, including cardiovascular disorders. The authors emphasized that hybrid AI models utilizing electrocardiogram and skin hydration measurement signals can help study the relationship between AF and skin hydration levels since low fluid levels in the body increase the risk of cardiac dysfunction. Therefore, the advantages and disadvantages of various algorithms for skin hydration estimation are also discussed. This study provides an outlook on the relationship between skin hydration level and AF and will help advance research in the direction of cardiovascular health monitoring.

The second article *"Edge intelligence in private mobile networks for next generation railway systems"* authored by Asad et al. examines how edge AI might assist in the handling of these technological challenges, in the context of next-generation railway systems (NGRS). While AI and machine learning advancements open an entirely new world of possibilities, these applications also demand higher levels of performance, improved data security, and more control over continuous operations. Several use cases of NGRS enabled by Edge AI were described in the paper, as well as how Edge AI addresses communication-related challenges, including the need for low-latency and low-power communication; diversity of bandwidth requirements; and high reliability. To support various NGRS applications, the authors presented a conceptual design of an intelligent private network (IPN) that employs edge intelligence and beyond 5G technologies. The proposed system can help automate the coordination between various

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Edited and reviewed by:
Akram Alomainy,
Queen Mary University of London,
United Kingdom

***Correspondence:**
Ahmed Zoha
ahmed.zoha@glasgow.ac.uk

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components within a train network. Among the possible applications of such a network are real-time visibility and control of depot tracks, as well as autonomous control of train movements with low-latency devices.

The third article *"Social sensing for sentiment analysis of policing authority performance in smart cities"* authored by Malik et al. presents a case study of opinion mining by analysing social media data related to the civic and police authority performance within the city of Lahore, Pakistan. In addition to enabling the development of innovative applications and services, AI is becoming sufficiently intelligent to understand how engaged and satisfied the end-users are with the help of sentiment analysis (SA). AI-powered tools can analyse textual feedback, such as social media posts, which have already been posted and subsequently feed the information back into the process to improve customer satisfaction. The data used in this paper is collected from Facebook, Twitter, YouTube, and Web TV, and sentiment analysis is performed in both the local language and English. Since current research is mainly focused on improving SA models for English text, the authors emphasize the importance of developing SA models for local languages. The SA model utilizing both English as well as Urdu has been reported as reaching a performance score of over 85%. Over 16,000 comments have been analysed using state-of-the-art machine learning models. The comments have been categorized as positive, neutral, and negative, and the temporal variations over 19 months has also been examined and discussed. These AI-driven tools not only help measure the gap between public views and civil services but enables policymakers to reshape and rethink policies and services according to citizen needs.

We hope that the AI-powered IoT community and the larger networking and communications research community will benefit from the insights presented in the three articles accepted for publication in this Research Topic. We sincerely thank all the authors and reviewers for their help and efforts. We would like to thank the staff members and the Editor-in-Chief of Frontiers in Communications and Networks for their guidance and help.

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AZ and JQ contributed to the writing of the editorial. QA helps in the editing and provided feedback. All authors contributed to the editorial and approved the submitted version.

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