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22 November 2026

From the Editor's Desk

Intelligent Consumer Technologies: Collaborative Ecosystems from Edge to Cloud

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I WELCOME THE READERS to the sixth issue of 2026, the November/December edition of *IEEE Consumer Electronics Magazine (MCE)*.

INTELLIGENT CONSUMER TECHNOLOGIES: COLLABORATIVE ECOSYSTEMS FROM EDGE TO CLOUD

Next-generation consumer technologies are increasingly characterized not by individual device capabilities, but by their ability to cooperate within intelligent ecosystems. Advances in artificial intelligence (AI), distributed computing, communications, and intelligent sensing enable consumer devices to exchange information, share computational resources, and jointly deliver adaptive, context-aware, and increasingly autonomous services across the edge-to-cloud continuum.

This issue explores this evolution through collaborative intelligence, resilient IoT infrastructures, immersive extended reality, video coding, serverless edge computing, generative AI, and connected sensing. Collectively, the articles show how cooperation among devices, networks, edge and cloud platforms, and AI models is defining more connected, adaptive, and intelligent consumer ecosystems.

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COLUMN

The issue opens with the column contribution by Dong and Yang et al. [1], who discuss recent advances in Physical AI and their implications for consumer technologies. By enabling intelligent systems to perceive, reason, and interact with the physical world, Physical AI is expected to become a key enabler of collaborative consumer ecosystems.

SPECIAL SECTION ON COLLABORATIVE INTELLIGENCE FOR CONSUMER IOT DEVICES

This issue includes four out of the 21 articles selected for the Special Section on "Collaborative Intelligence for Consumer IoT Devices: From Edge Swarms to Cloud Synergy." The selected articles span distributed AI, resilient architectures, edge–cloud cooperation, and digital twins for connected mobility.

Houache et al. [2] present a collaborative generative AI framework that enhances security in distributed consumer IoT environments.

Krishna et al. [3] propose a self-healing neuromorphic architecture for resilient consumer IoT systems.

Zhou et al. [4] introduce a game-driven workload distribution strategy for vehicular mobile edge computing, improving latency-sensitive consumer services.

Finally, Xia et al. [5] investigate a digital twin-driven framework for edge–cloud collaboration in consumer vehicular IoT.

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I thank again the Guest Editors, Paolo Napoletano, Md. Jalil Piran, Chiu-Wing Sham, and Gordana Velikic, for their dedication and outstanding efforts in coordinating this Special Section, which I am confident will provide valuable insights for the *MCE* community.

FEATURE ARTICLES

This issue features five other articles that broaden the discussion through collaborative XR, practical video coding, distributed edge infrastructures, generative AI, and connected sensing.

Shah et al. [6] investigate collaborative intelligence for ultra-low-latency XR experiences over future 6G consumer networks.

Valera et al. [7] compare the V-Nova LCEVC SDK with practical open source video codecs, examining the tradeoffs between compression efficiency and computational requirements for consumer video applications.

Puliafito et al. [8] address service continuity for serverless-edge consumer applications.

Ganie et al. [9] discuss multimodal generative AI for scalable synthetic dataset generation.

Finally, Rubio et al. [10] introduce an intelligent air pollution monitoring device for micromobility within the Internet of Vehicles.

LOOKING FORWARD

The articles presented in this issue demonstrate how collaborative intelligence is shaping increasingly adaptive consumer ecosystems. I hope readers will find these works informative and inspiring as *MCE* continues to highlight emerging technologies and innovative applications from academia and industry.

APPENDIX: RELATED ARTICLES

1. L. Yang, H. Dong, and A. El Saddik, "Physical AI labeling," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3688814.
2. M. Houache, D. E. Boubiche, L. Guezouli, A. Chehri, and G. Jeon, "Collaborative generative AI for securing IoT based consumer electronics," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3704751.
3. Y. C. Krishna and B. N. K. Reddy, "Self-healing neuromorphic architecture for resilient consumer IoT," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3692960.
4. J. Zhou, X. Xu, M. Bilal, G. Cui, and S. Fu, "Game-driven adaptive workload distribution for consumer vehicular mobile edge computing," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3702290.
5. Z. Xia, J. Yang, Z. Song, M. A. Khan, S. Ayouni, J. Zheng, Y. Hua, L. Y. Por, and H. Ding, "Digital twin driven video stream for edge–cloud collaboration in consumer vehicular IoT," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3715282.
6. S. D. A. Shah, F. Ali, A. A. AlZubi, and D. Kwak, "Collaborative intelligence: Orchestrating ultra-low latency XR experiences in 6G consumer networks," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3698602.
7. M. Valera, R. Rodríguez-Sánchez, P. Cuenca, G. Cebrián-Márquez, A. J. Diaz-Honrubia, and D. García-Lucas, "Comparing V-Nova LCEVC SDK with practical open source video codecs," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3658302.
8. C. Puliafito, A. Virdis, and E. Mingozzi, "Service continuity for serverless-edge consumer applications: Opportunities and issues," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3666287.
9. S. H. Ganie, A. A. Ganie, Y.-L. Chen, B. Ahmad, and L. Y. Por, "Multi-modal generative AI for scalable synthetic dataset generation in autonomous vehicles: Advancements, challenges and opportunities in intelligent transportation systems," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2025.3646571.
10. J. Rubio, J. Santa, and O. de Francisco Ortiz, "Air pollution monitoring device for micromobility in the Internet of Vehicles," *IEEE Consum. Electron. Mag.*, vol. 15, no. 6, pp. xx–xx, Nov./Dec. 2026, doi: 10.1109/MCE.2026.3684542.

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