IEEE Transactions on Consumer Electronics

Call for Papers

Special Section on "Advances in Artificial intelligence (AI) enabled Vehicular Edge Computing (VEC) for consumer electronics"

Theme:

Smart vehicles, particularly new energy vehicles, represent a fusion of real-time sensing, communication, and computation that transcends their role as mere transportation. From a consumer's perspective, they resemble scintillating electronic to in the field of consumer electronics. These IoT-enabled smart vehicles constantly generate substantial volumes of data (or tasks), encompassing both time-critical information vital for driving safety and time-insensitive data relevant to infotainment services. To address the data processing requirements, Vehicular Edge Computing (VEC) has emerged as a promising computing paradigm, focusing on the efficient processing of tasks and data close to their source. However, VEC faces formidable challenges due to the dynamic topology inherent in vehicular ad hoc networks (VANET), the rapid mobility of vehicles, and the inherent limitations of computing resources in edge servers. These challenges, including the need to maintain high throughput, underscore the complexity of VEC systems and networks.

In the field of consumer electronics, the delivery of high-quality computing services holds paramount importance for consumers. Simultaneously, AI has achieved remarkable breakthroughs in diverse fields such as image processing, natural language processing, and self-driving technology. AI-enabled VEC is poised to revolutionize data processing, task offloading, and resource scheduling, particularly from the consumer electronics perspective. However, AI-enabled VEC is also facing some critical challenges. Some of these include the absence of a universally accepted dataset and comprehensive methodology to guide research in this domain. Moreover, resource-constrained smart vehicles struggle to deploy computationally intensive AI algorithms or train large AI models. The paradigm of cloud-based training and edge-based inference in AI-enabled VEC requires further investigation to reach its full potential. Additionally, there are substantial concerns related to cyber-physical security and the reliability of AI-enabled VEC systems. These challenges serve as a compelling motivation for the proposal of this special section dedicated to AI-enabled VEC for consumer electronics. Its primary objective is to bring together the latest and high-quality research studies to foster substantial progress in this burgeoning field, ultimately benefiting consumers and advancing the state of consumer electronics.

Topics of interest in this Special Section include (but are not limited to):

- AI-enabled crowdsensing for smart vehicle applications

- DNN based theory/model/architecture for VEC
- Intelligent localization, navigation, and tracking in VEC
- Vehicular networks with autonomous systems for consumer electronics
- Deep reinforcement learning for VEC
- Intelligent algorithm design for task offloading, data processing and resource scheduling
- Caching assisted task undertaking in VEC for consumer electronics
- Information model & protocols facilitating AI-enabled VEC for consumer electronics
- Human-vehicle interactive intelligence for consumer electronics
- Privacy & security schemes targeting AI-enabled VEC for consumer electronics
- Demonstration of prototypes/systems of AI-enabled VEC for consumer electronics

Important dates:

- End of submission of Manuscripts: March 31, 2024
- Expected publication date (tentative): 4th quarter 2024

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Instructions for authors:

Manuscripts should be prepared following guidelines at: https://ctsoc.ieee.org/publications/ieee-transactions-on-consumer-electronics.html and must be submitted online following the IEEE Transactions on Consumer Electronics instructions: https://ctsoc.ieee.org/publications/ieee-transactions-on-consumer-electronics.html. During submission, the Special Section on "**Advances in Artificial intelligence (AI) enabled Vehicular Edge Computing (VEC) for consumer electronics**" should be selected.