EDITORIAL

Sensing, Communication, and Control: A New Transactions

Xuebo Jin[1,*]

[1] School of Computer Science and Artificial Intelligence, Beijing Technology and Business University, Beijing 100048, China

Dear esteemed readers,

On behalf of the Editorial Board, I am very pleased to announce the launch of our new transactions, *ICCK Transactions on Sensing, Communication, and Control*. This publication aims to serve as a premier platform for researchers, engineers, and scholars to share cutting-edge discoveries, methodologies, and applications in the rapidly evolving fields of sensing, communication, and control.

The convergence of sensing, communication, and control technologies has been a driving force behind the increasing complexity of modern systems. As we stand on the cusp of a new era in information and control technology, the intricate interplay between these domains has become more crucial than ever. The advent of 5G and the anticipated arrival of 6G technologies have ushered in unprecedented opportunities for high-speed, low-latency communication, enabling real-time data exchange and control in complex systems [1].

The history of these interconnected fields is marked by continuous innovation and cross-pollination of ideas. From the early days of simple feedback control systems to today's sophisticated interconnected cyber-physical systems, the integration of sensing, communication, and control has undergone a remarkable evolution, fundamentally reshaping how modern systems perceive, interact with, and regulate the physical world [2]. This journal seeks to capture and propel this ongoing evolution.

In recent years, we have witnessed groundbreaking advancements across these domains:

- **Sensing Technologies**: The development of miniaturized, high-precision sensors has revolutionized fields ranging from environmental monitoring to healthcare. For instance, wearable devices now incorporate an array of sensors that can continuously monitor vital signs, activity levels, and even predict potential health issues.
- **Communication Systems**: The rollout of 5G networks has dramatically increased data transmission speeds and reduced latency, paving the way for applications like autonomous vehicles and smart cities. Looking ahead, 6G technology promises to push these boundaries even further, potentially enabling holographic communication and ubiquitous connectivity.
- **Control Systems**: Advanced control algorithms, often powered by artificial intelligence and machine learning, are enabling unprecedented levels of automation and optimization in industries such as manufacturing, transportation, and energy management.

The synergy between these fields is evident in a

Submitted: 23 August 2024
Accepted: 02 October 2024
Published: 08 October 2024

Vol. 1, **No.** 1, 2024.
10.62762/TSCC.2024.287867

***Corresponding author:**
✉ Xuebo Jin
jinxuebo@btbu.edu.cn

Citation
Jin, X. (2024). Sensing, Communication, and Control: A New Transactions. *ICCK Transactions on Sensing, Communication, and Control*, 1(1), 1–2.

© 2024 ICCK (Institute of Central Computation and Knowledge)

wide range of emerging applications across various domains. For instance, in smart cities, advanced sensor networks gather real-time data on traffic flow, air quality, and energy consumption [3]. IoT-enabled communication infrastructure then transmits this vast amount of information to centralized or distributed control centers, forming the backbone of smart city management [4]. There, sophisticated control algorithms process the data and make decisions to optimize urban operations, from adjusting traffic signals to managing power grids. Similarly, in modern manufacturing environments, sensors monitor production processes, communication networks enable real-time data exchange across the factory floor, and intelligent control systems adapt production parameters to maximize efficiency and quality. This intricate interplay of sensing, communication, and control technologies is driving innovation and efficiency improvements across numerous sectors, from healthcare and transportation to agriculture and environmental management. This intricate dance of technologies is at the heart of what our journal aims to explore and advance.

ICCK Transactions on Sensing, Communication, and Control welcomes contributions that span the spectrum from theoretical foundations to practical applications. We encourage submissions in the form of original research papers, comprehensive review articles, and thought-provoking editorials. Our goal is to foster a vibrant community of researchers and practitioners who can collectively push the boundaries of what's possible in these interconnected domains.

Key areas of interest include, but are not limited to:

- Advanced sensing technologies and sensor networks
- Next-generation communication systems (5G, 6G, and beyond)
- Innovative control algorithms and methodologies
- Integration of AI and machine learning in sensing, communication, and control
- Cyber-physical systems and IoT applications
- Security and privacy in networked control systems
- Energy-efficient sensing and communication for sustainable development

We believe that the confluence of sensing, communication, and control technologies will continue to drive innovation across various sectors, including smart manufacturing, intelligent transportation, healthcare, and environmental monitoring. By providing a platform for sharing the latest research findings, methodologies, and applications, we aim to accelerate progress in these critical areas.

As we launch this new journal, we invite you to join us on this exciting journey. Whether you are a seasoned researcher, an industry practitioner, or a curious student, your contributions and insights are valuable to our community. Together, we can shape the future of sensing, communication, and control technologies, and their applications in creating smarter, more efficient, and more sustainable systems.

We look forward to receiving your submissions and engaging in stimulating discussions that will drive our field forward. Thank you for your support, and here's to a future filled with groundbreaking discoveries and innovations!

Data Availability Statement

Not applicable.

Funding

This work was supported without any funding.

Conflicts of Interest

The author is the Editor-in-Chief of *ICCK Transactions on Sensing, Communication, and Control*. This Inaugural Editorial was not externally peer reviewed and was accepted directly by the publisher. The Editor-in-Chief was not involved in the handling or decision-making of this manuscript.

References

[1] Saad, W., Bennis, M., & Chen, M. (2019). A vision of 6G wireless systems: Applications, trends, technologies, and open research problems. *IEEE network*, 34(3), 134-142. [CrossRef]

[2] Shi, J., Wan, J., Yan, H., & Suo, H. (2011, November). A survey of cyber-physical systems. In *2011 international conference on wireless communications and signal processing (WCSP)* (pp. 1-6). IEEE. [CrossRef]

[3] Perera, C., Zaslavsky, A., Christen, P., & Georgakopoulos, D. (2013). Context aware computing for the internet of things: A survey. *IEEE communications surveys & tutorials*, 16(1), 414-454. [CrossRef]

[4] Zanella, A., Bui, N., Castellani, A., Vangelista, L., & Zorzi, M. (2014). Internet of things for smart cities. *IEEE Internet of Things journal*, 1(1), 22-32. [CrossRef]