ACM Transactions on Internet Technology – Special Issue on

Cognitive Robotics on 5G/6G Networks

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5G networks have made a significant progress towards developing a low latency tactile access network and opened new opportunities for innovative automation of network resources and operations. While the deployment of 5G is ongoing, we are also starting to define 6G networks. Meanwhile, cognitive computing breaks the boundary between neuroscience and computer science. It paves the way for machines to have reasoning abilities which are analogous to human. The research field of cognitive computing is interdisciplinary and uses knowledge and methods from many areas such as psychology, biology, signal processing, physics, information theory, mathematics, and statistics. The development of cognitive robotics will keep cross-fertilizing these research areas. However, in cognitive robotics applications there still remain many open problems in using 5G/6G networks. Technologies like millimeter wave band-based MIMO and software defined networking are driving the development of better tools for upgrading the networked robots with near human intelligence, which can be intended to physically interact with humans in a shared workspace.

The next generation of cognitive robotics will resemble the nervous system to create new smart infrastructures that feature proactive, secure and adaptive paradigms. With the increase of large autonomy of systems, the protection of cognitive robotics against malicious attacks becomes significantly important.

The overall aim of this special issue is to collect the state-of-the-art contributions on the architecture, technologies of 5G/6G networks, and related applications in robotics. The journal invites submissions for a special issue on "Cognitive Robotics on 5G/6G Networks" that aims to attract high-quality papers that describe state-of-the-art technologies and new findings both in soft computing and robotics research fields. The topics of interest include, but are not limited to:

- Novel theoretical insights on cognitive computing for networked robotics
- Artificial intelligence/machine learning assisted PHY and networks
- MU-MIMO and new antenna technologies for robotics
- Quantum/terahertz communications for robotics
- 5G/6G-enabled vertical applications and services in robotics
- Knowledge-based AI for robot control
- New core network entities and interfaces
- Cloud/fog/edge computing and IoT for robotics