

# IET *Control Theory & Applications* Call for Papers













## SPECIAL ISSUE ON:

## Distributed Optimisation and Learning for Networked Systems

Editor-in-Chief: James Lam, University of Hong Kong, Hong Kong

Rapid developments in digital systems, communication and sensing technologies have led to the emergence of networked systems. These networked systems consist of a large number of interconnected subsystems (agents) required to cooperate to achieve a desirable global objective. Potential applications for such networked systems include, but are not limited to power systems, sensor networks, robot teams, transportation systems, smart buildings, and smart and connected communities. Problems in networked systems can arise in the framework of optimisation and learning but, due to their distributed nature, traditional centralised strategies are not suitable to solve these optimisation problems. In addition, the centralised framework is subject to performance limitations, such as a single-point failure, high communication requirement and cost, substantial computational burden, and limited flexibility and scalability. These limitations have made the use of distributed optimisation imperative for solving large-scale networked system control and optimisation problems. The distributed optimisation problem has been studied for a long time and has gained a significant renewed growing interest over the last decade due to its wide applications in machine learning, power systems, communication networks, and sensor networks. Despite the volume of work in this area, there are still many open challenges, such as acceleration of convergence, global convergence for nonconvex problems, performance guarantees for nonlinear systems, communication efficiency, and robustness to cyber-attacks.

The goal of this special issue is to bring together and share technical and scientific findings and visions, and new distributed optimisation strategies with applications to various engineering applications. Potential topics can include:

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|---|---|
|  Distributed accelerated optimisation algorithms |  Distributed control and optimisation under limited communication resources                                    |
|  Distributed Augmented Lagrangian methods        |  Distributed control and optimisation with complex system dynamics   |
|  Distributed primal-dual optimisation algorithms |  Distributed graphical games with performance guarantees   |
|  Distributed online optimisation                 |  Distributed control and optimisation with applications to power systems, transportation systems, and robotics |
|  Distributed stochastic optimisation algorithms  |   |
|  Distributed algorithms for machine learning     |   |
|  Distributed reinforcement learning              |   |
|  Distributed adaptive control and optimisation   |   |

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