

## IEEE HPCC 2021

### Special Session: Distributed Intelligence for Future High Performance Unmanned Mobile Systems

Due to the explosive development of unmanned system components, such as autonomous cars, unmanned aerial vehicles, and edge devices, designing future mobile and communication systems becomes much more challenging in terms of independent control and decision making, efficient autonomous system operations, distributed system architectures, mobility issues, etc.

Recently, machine learning (ML) and artificial intelligence (AI) enabled distributed intelligence has become a promising approach to address the aforementioned intelligent control challenges in the premise of large-scale decentralized unmanned and mobile systems. Moreover, distributed intelligence approaches exploit the computational capabilities of edge components (e.g., UAVs and edge devices) in such networks. Unmanageable network optimization and underutilized computational power of system components within centralized system architectures, can be efficiently solved by applying distributed intelligence approaches, e.g., crowd collaboration and intelligence, distributed consensus, multi-agent learning, and edge computing enabled high performance computing. The capability of edge can be efficiently exploited. Decentralized data processing, learning, and data security approaches can be studied and implemented, such as collaborative learning, federated learning, and blockchain.

The goal of this full-day workshop is to bring together researchers and experts from academia, industry, and governmental agencies to discuss and promote the research and development needed to overcome the major challenges in this research direction. The scope of this workshop includes but not limited to:

- Theories, frameworks, and algorithms of distributed intelligence for high performance unmanned mobile networks
- PHY infrastructure for distributed intelligence for unmanned mobile systems
- Intelligent access control and resource allocation for unmanned mobile systems
- Distributed intelligence empowered future unmanned mobile networks
- Edge intelligence designs and algorithms design for future unmanned systems
- Distributed and collaborative machine learning for unmanned mobile systems
- Distributed control and data privacy, security, attack/defense, and data persistence approaches in unmanned mobile systems
- Distributed intelligence enabled green and energy-efficient unmanned mobile systems
- Network economics for unmanned mobile systems with distributed intelligence
- Explainable and responsible distributed artificial intelligence for unmanned mobile systems
- Simulations, experiments, and testbeds of distributed intelligence for high performance unmanned mobile systems
- Use cases and application scenarios highlighting distributed intelligence for high performance unmanned mobile systems

### Organizers

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