

## IEEE ICNSC 2023

October 25-27, 2023, Marseille, France



IEEE



IEEE  
SMC  
Systems, Man, and Cybernetics Society



### Proposal for Special Session at ICNSC'23

#### Session Title:

Unmanned Vehicle-Aided Routing and Scheduling: Models, Algorithms, and Applications

#### Description and Aim:

Unmanned Vehicles, including Unmanned Aerial Vehicles (UAVs), Unmanned Surface Vehicles (USVs), and Automated Guided Vehicles (AGVs), are emerging as game-changing technologies that have the potential to revolutionize the industrial field. These vehicles are often equipped with sensors, cameras, and other advanced technologies to perform certain tasks with high precision, accuracy, and low risk. The innovative use of unmanned vehicles brings numerous benefits, such as increased efficiency, cost reduction, improved safety, greater accuracy and consistency, access to hard-to-reach areas, environmental benefits. They are thus increasingly being used in a variety of applications in the industrial field. For example, in supply chains, AGVs are being used for material handling, logistics, and transportation. Autonomous buses, taxis, and trucks are being developed for public transportation and logistics aiming to reduce congestion and emissions.

Using unmanned vehicles creates new optimization problems, e.g., 1) Route optimization: Optimizing routes for unmanned vehicles can be challenging due to dynamic obstacles, limited communication, and uncertain environments. 2) Scheduling optimization: Scheduling unmanned vehicles to perform tasks in an efficient and effective manner is challenging due to the dynamic nature of the tasks and the need to coordinate multiple vehicles. 3) Resource allocation: Allocating resources such as fuel, batteries, or payloads among unmanned vehicles is challenging due to the need to balance resource constraints with task requirements. Solving these challenging optimization problems will require the development of new models, algorithms, and techniques to help decision-makers make informed decisions.

The aim of this session is to provide a platform for researchers and practitioners to share their latest findings and developments in unmanned vehicle-aided routing and scheduling, and to discuss the challenges and opportunities in this field. We believe that this session will inspire new ideas, collaborations, and innovations that will help to shape the future of the industrial field.

#### The potential topics include (but are not limited to):

This session will cover a range of topics related to unmanned vehicle-aided routing and scheduling, including:

- Optimization models and algorithms for routing and scheduling of unmanned vehicles



## IEEE ICNSC 2023

October 25-27, 2023, Marseille, France



IEEE



IEEE  
SMC  
Systems, Man, and Cybernetics Society



- Dynamic routing and scheduling in uncertain and dynamic environments
- Coordination and collaboration among multiple unmanned vehicles
- Applications of unmanned vehicle-aided routing and scheduling in the industrial field
- AGV scheduling with battery constraints
- AGV routing with flexible charging
- Truck-drone collaborative routing problem
- Carrier-vehicle routing problem
- AGV scheduling in production systems and port logistics
- USV scheduling in offshore logistics
- UAV scheduling in offshore inspection
- UAV scheduling and routing in goods delivery practice
- Other topics related to the scheduling and routing of unmanned vehicles

### Expected number of papers: 6

#### Organizers:

**Dr. Yantong Li**, Associate Professor  
School of Maritime Economics and Management  
Dalian Maritime University  
E-mail: [yantong.li@dlnu.edu.cn](mailto:yantong.li@dlnu.edu.cn)

**Dr. Yipei Zhang**, Lecturer  
School of Economics and Management  
Chang'an University  
E-mail: [zhangyipei@chd.edu.cn](mailto:zhangyipei@chd.edu.cn)

**Dr. Qianli Ma**, Lecturer  
School of Maritime Economics and Management  
Dalian Maritime University  
E-mail: [qianlima@dlnu.edu.cn](mailto:qianlima@dlnu.edu.cn)

