Special Issue on
Load Transportation using Aerial Robots

CALL FOR PAPERS

Contactless delivery has been increasing in recent years. Unmanned aerial vehicles (UAVs), such as drones, are playing a vital role in ensuring businesses and customers interact as little as possible. Some African nations have invited US drone companies to assist their rural hospitals. Using drones in China reportedly decreased the delivery time by over 50 percent as compared to road transportation, and it took humans out of the process. Contributing to the increase of their application in load transportation, UAVs have been designed with better vision systems and sensing capabilities, increased thrust-to-weight ratio, improved battery efficiency, and onboard processing. These advances turn the feasible design of controllers to perform aggressive manoeuvres to navigate in cluttered scenarios, and the online planning of paths in dynamic environments.

However, the small size of those UAVs limits their payload capacity, which motivated some research groups to work with a team of agents to overcome such a limitation. Moreover, a UAV fleet can also guarantee the accomplishment of a transportation mission even if one or more quadrotors suffer a structural, power, or electronic malfunction. In fact, load transportation using quadrotors attends commercial, militarian, and civilian interests. Talking specifically about load transportation, it has been accomplished using two major carrying strategies, which are either the suspension of the load through cables or the attachment of the cargo to the quadrotor body. For the former, the cable-suspended load increases the number of under-actuated degrees of freedom, thus modifying the system dynamics. For the latter, the load attached to the quadrotor body increases its inertia, making it unfit for fast attitude response and agile manoeuvres. In both cases, the controller in charge of guiding the vehicle should be quite different from a controller designed to guide the UAV when navigating without a load. There has been tremendous progress in autonomous load transportation using aerial robots in recent years. There are still some open problems in this field, such as fast optimality, trajectory planning, agile cooperative transportation using only robotic vision, and local communication between neighbours, and navigation or performing exploration missions in an unknown environment.

The aim of this Special Issue is to bring together original research and review articles discussing load transportation using aerial robots.

Potential topics include but are not limited to the following:

- ▶ Aerial load transportation
- ▶ Robotic object grasping and manipulation
- ▶ Contact dynamic modelling
- ▶ Advanced UAV control algorithms
- ▶ State estimation for aerial robots
- ▶ Path planning for load transportation
- ▶ UAV formation flying
- ▶ Controller design using the Lie group SE(3)
- ▶ Collaborative manipulation
- ▶ Force and shape sensing techniques
- ▶ Learning algorithms for load transportation systems
- ▶ Advanced UAV design
- ▶ Engineering applications of load transportation systems

Authors can submit their manuscripts through the Manuscript Tracking System at https://review.hindawi.com/submit?journal=ijae.

Papers are published upon acceptance, regardless of the Special Issue publication date.

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