



## E12 – Fast delivery of emergency pills

The first ERL Smart City RObotic Challenge (the SciRoc challenge) will be held in Milton Keynes (UK) from September 16th to September 22nd, 2019.

**General description.** The aerial robot must attend an emergency situation in which a first-aid kit needs to be delivered to a customer. The robot must be able to fly autonomously to the customer location as fast as possible. The robot might need to detect and avoid possible obstacles on the way, and it must take into account that GPS coverage is not always guaranteed.

**Platforms allowed.** VTOL aerial robot that can carry and deliver items in specific locations, navigate in outdoor and indoor spaces, detect and avoid obstacles.

**Setting.** The episode must take place inside the flying arena. Within the arena, a marquee can be installed to represent an indoor mall space, and the customer can be represented by a mannequin placed inside the marquee.



**Procedure.** A first-aid kit request reaches a medical centre with medicine storage. The responsible of such centre fills the first-aid kit ready to be delivered, and attaches it to the aerial robot which is located in the take-off position. The robot takes off with the kit towards the marquee location, detecting and avoiding different obstacles on the way. Once at the marquee, it must enter through an opening, detect the mannequin, land nearby and release the first-aid kit on the floor. Once delivered, the aerial robot must take off again, exit the marquee and reach again the initial take-off location, ready for the next delivery.

**DH interaction.** *Type: data consumption and generation.* The broad position of the customer in need is communicated to the aerial robot by the MK:DataHub. The robot should provide images/video to the MK:DataHub during the mission.

**Main functionality(ies).** The main functionalities tested are Autonomous Navigation in outdoor and indoor unstructured environments and Obstacle Detection.

**Auxiliary functionalities.** Other required functionality is Person Detection.

### Achievements.

- Entering the marquee.
- Detecting the customer.

- Landing and delivering the first-aid kit.
- Exiting the marquee.
- Landing at the starting location.
- Transmitting live images/video to the MK:DataHub.

#### Penalising behaviours.

- Manual interventions to the aerial robot in case it needs to be recovered from a failure.
- Hitting any of the structures in the flying arena (marquee, obstacles, safety net...).
- Flying/landing closer than a predefined small distance to the mannequin.
- Damaging the structures in the flying arena (marquee, obstacles, safety net...).
- Hitting the mannequin.
- Leaving the flying arena.
- Failing in transmitting data to the MK:DataHub.

#### Partners.

