



Research School for Operations  
Management and Logistics

**Last-mile Drone Logistics for Humanitarian Aid (AIRLIFT)**

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Following a severe natural or man-made disaster, life-saving operations require an efficient and immediate flow of relief goods into the affected area, as well as an exchange of information. However, these areas generally face damaged infrastructure- and communication networks, reducing access to the disaster area and victims. Unmanned Aerial Vehicles (UAVs), or drones, can offer a flexible, low-cost, and efficient alternative for the distribution of relief goods (e.g., food, medicines, and blankets). However, to deploy UAVs efficiently, new methods for facility location planning (e.g., what should be the base location for the UAVs) and routing problems (e.g., which UAV visit which locations in what sequence) are required. Additionally, UAVs can play a vital role in information gathering. When equipped with sensors and cameras, they can identify the area (e.g., locations of people, need of people, and condition of infrastructure). Using spatial agent-based modelling, artificial intelligence, digital twin technology, and remote sensing techniques, we aim to enable cost-effective scenario exploration of system behaviors and sensitivities to various types of perturbations, which is specifically relevant for the uncertain and volatile situations that typically occur in the period directly following a disaster. The proposed solutions should be flexible and scalable for speeding up humanitarian logistic response after any disaster.