AutoTarget : Autonomous Multi-UAV (Unmanned Aerial Vehicle) for the Characterization of Remote and Isolated Targets

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Abstract

This research focus on the development of an autonomous multi-UAV (Unmanned Aerial Vehicles) system, capable of performing target detection and characterization via a domaining approach. The core concept lies in the distribution of tasks to at least two communicating UAVs with specified capabilities (UAV1 and UAV n), flying at the same time. The obtained results are processed in (near-)real time to property maps and passed to the operator by UAV 1 for further interpretation and decision-making. With this concept, the multi-UAV approach allows the fast detection and characterization of isolated, remote targets in a time and resource efficient manner. As high-dimensional / high-detail data is only acquired where it matters, large volumes of superfluous data can be avoided from the start, and such, processing time and computational requirements are reduced. In parallel, the knowledge on the targets' properties can be tremendously increased for more accurate and detailed characterization as well as the avoidance of false positives. The targeted multi-drone approach further decreases the impact of the survey on environment, wildlife, and population by reducing the necessary impact to a minimum as well as the flight time.
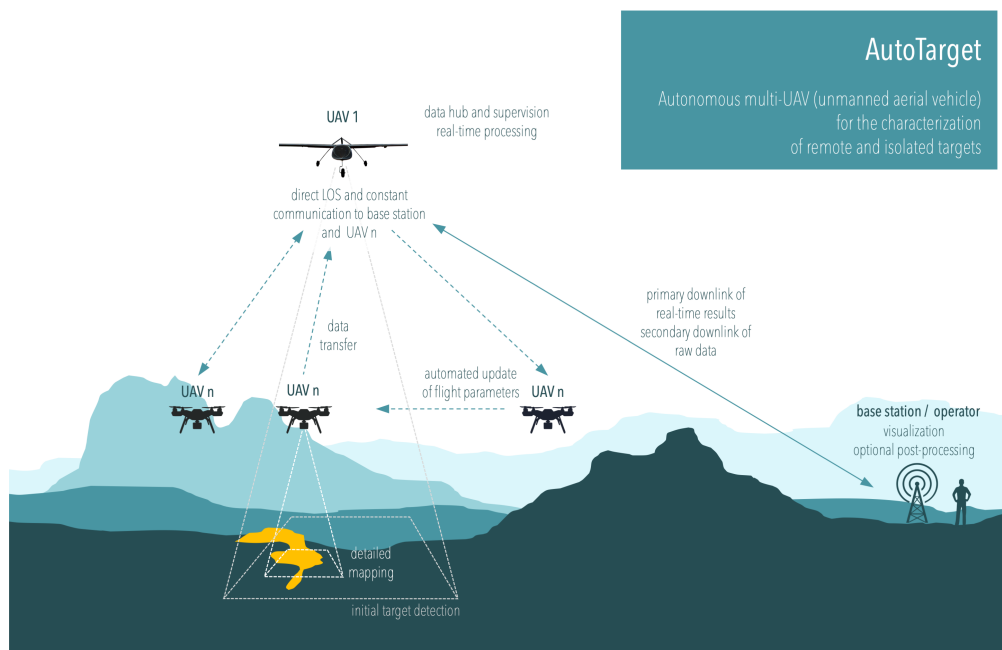
Figure 1. Overview of the Distributed Processing Concept.