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Multi-Drone Coordination for Aerial Imaging

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Drone technology has proven to be helpful in the automation of various monotonous tasks, ranging from search and rescue to crop monitoring. In our case, we wish to expand the capabilities of a dynamic-height single-drone algorithm for area coverage path planning to multiple drones. We propose two algorithms to plan both paths and height management for a team of quadrotor drones trying to spot and count birds in various distributions within an area enclosed by an arbitrary polygon. We propose a solution to a case in which bird locations are known to follow a certain set of density distributions. We split the area into two sub-regions of high and low density to be traversed differently from one another. Our cooperative approaches aim to reduce the time it takes to cover all aforementioned birds while at the same time increasing counting accuracy when compared to a single-drone approach, and a naive multi-drone approach that does not adapt to density. Our measurement of utility will be through accuracy, and time and energy spent.