Genetic Algorithm-based Path Planning for an Unmanned Aerial Vehicle Considering Energy Consumption and Payload

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Unmanned Aerial Vehicles (UAVs), more commonly known as drones, have a wide range of applications spread across various industries. Drones are plagued with several challenges concerning their limited battery life and payload. Until researchers come up with a much more advanced and long-lasting battery solution, drones must use the most optimum path for delivery, which will increase battery efficiency and reduce overheads. This study analyses the battery energy consumption, velocity, and flight time of the quadcopter for varying payloads and develops a suitable mathematical relationship for path planning problem formulation. This paper proposes a Genetic algorithm -based path optimization to obtain the most energy optimal path for the drone carrying a certain payload for a set of specified destinations.

Keywords: *path planning, unmanned aerial vehicle, genetic algorithm*