A Gravitational Black Hole Algorithm for Autonomous UCAV Mission Planning in 3D Realistic Environments

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Abstract

This article addresses a novel approach to 3D mission planning of UCAVs in constrained environments. To solve this NP-hard problem, black hole algorithm (BH) is improved by considering stars gravities information. By modelling UCAV properties, aerospace constraints and DTM of environment, proposed mission planner based on black hole optimization algorithm is proposed. Also it provides a comparative study for efficiency evaluation of evolutionary 3D mission planners based on ACO, BA, DE, ES, GA, BH and PSO optimization algorithms. Then mission planning task of UCAV is performed. Simulations show the advantage of proposed gravitational BH mission planner.

References

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optimization approach to multi-UAVs coordinated trajectory replanning in dynamic and uncertain environments,


**Index Terms**

Computer Science

Artificial Intelligence

**Keywords**

Unmanned combat aerial vehicle (UCAV)  Flight simulation  3D mission planning

Black hole optimization algorithm