

國科會計畫

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無人攻擊機任務規劃攻擊模式分析研究  
Studies of Mission Planning System and Its Target Modes for Attack Drones

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中文摘要

本研究計畫之目的為分析無人攻擊機攻擊模式之任務規劃系統(Mission Planning System)中，目標(Target)預置航點(Waypoint)之三維立體幾何及載具飛行諸元與動態資料的關係。攻擊模式包括投放型態(Delivery Type)及逃脫模式(Escape Mode)。目標預置航點之投放型態一般而言，包括俯衝模式(Dive)、俯衝投彈模式(Dive/Toss)、平飛投彈模式(Level/Laydown)、爬升投彈模式(Loft/Toss)、急速爬升模式(Pop)及偵搜模式(RECCE, Reconnaissance)等，而本研究計畫之研究範疇將就目標預置航點之投放型態中的平飛投彈模式、爬升投彈模式及急速爬升模式分析，並以戰術飛行之空對地攻擊模式為藍本，研究無人攻擊機任務規劃攻擊模式，包括載具之飛行諸元、三維立體幾何與動態資料等，完成自上一預置航點，經戰術拉升飛行，目標預置航點之投放型態的平飛投彈模式、爬升投彈模式或急速爬升模式，經逃脫模式中平飛滾轉安全逃脫模式(Level Turn Safe Escape, LTSE)，至下一預置航點之載具飛行諸元及三維路徑之分析與研究，並發展其可行之演算法則(Algorithm)及其軟體模組。

關鍵字：任務規劃；投放型態；逃脫模式；平飛投彈模式；爬升投彈模式；急速爬升模式

## Abstract

This project will study the mission planning of the attack drone for the UAV (Unmanned Aerial Vehicle). Target waypoint, or the so-called target leg, has to be studied in this project. It includes 2 stages such as delivery and escape. There are some modes both in delivery and in escape. The scope of this project comprises Level/laydown mode, loft/toss mode, and the pop mode of delivery and the level turn safe escape (LTSE) mode of escape since the limits of budget and time. The mission planning about air-to-ground attack of the UAV will refer to that of the tactical fighter. The necessary flight parameters for 3D display are studied and analyzed. They are time, 3D trajectory, vehicle attitude, speed, acceleration, bearing, range, path length, etc. The algorithm to calculate the necessary flight parameters is also developed in this project. It proposes the methodology to calculate the values of such necessary parameters from the previous waypoint to the next waypoint with constant specified time interval. A dynamic link library (DLL) which is Windows 2000/XP compatible is provided. The complexity for user is possibly reduced. It seems very complicated to realize the proposed algorithm due to input data. However, only one function call used to solve all the necessary parameters of the path points will be expected.

Key words : Mission Planning; Delivery Type; Escape Mode; Level/Laydown;  
Loft/Toss; Pop