

On-Line Path Planning for UAV in Dynamic Environment

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Abstract. Under the premise of predicting the dynamic obstacles, a UAV path planning strategy of variable rolling window combined with potential flows is proposed. By using an autoregressive model, the expression of prediction for dynamic obstacles between discrete sampling points is given. The rolling window is designed to a triangle, also with adaptive function based on speed and angle of incidence of the dynamic obstacles. Potential flows method is used in the rolling windows to plan the obstacle avoidance route. At last the whole route is smoothed to satisfy the UAV constraints of maximum turning angle. The problem solution implementation is described along with several simulation results demonstrating the effectiveness of the method.

Keywords: UAV, dynamic environment, autoregressive prediction, on-line path planning.

1 Introduction

The active area of UAV (Unmanned Aerial Vehicle) is often a dynamic uncertain environment, so it is necessary for UAV to avoid some dynamic obstacles such as ground radar vehicles and mobile artillery threats. In this circumstance, how to generate a new flight path quickly becomes one of the prerequisites for UAV to complete mission successfully. Since the environment of battlefield is constantly changing,

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