

## Chapter 6

# PATH PLANNING FOR UNMANNED AERIAL VEHICLES IN UNCERTAIN AND ADVERSARIAL ENVIRONMENTS\*

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**Abstract** One of the main objectives when planning paths for unmanned aerial vehicles in adversarial environments is to arrive at the given target, while maximizing the safety of the vehicles. If one has perfect information of the threats that will be encountered, a safe path can always be constructed by solving an optimization problem. If there are uncertainties in the information, however, a different approach must be taken. In this paper we propose a path planning algorithm based on a map of the probability of threats, which can be built from *a priori* surveillance data. An extension to this algorithm for multiple vehicles is also described, and simulation results are provided.

**Keywords:** Unmanned aerial vehicles, path planning, probability map, uncertain adversarial environments, optimization

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