



## TECHNOLOGY

# Risk-Based Path Optimization

## OVERVIEW

Operating unmanned aerial vehicles (UAVs) over inhabited areas requires mitigating the risk to persons on the ground. Because the risk depends upon the flight path, UAV operators need approaches that can find low-risk flight paths between the mission's start and finish points. Since the flight paths with the lowest risk could be excessively long and indirect, operators are also concerned about the tradeoff between risk and flight time.

Researchers at the University of Maryland have created a risk assessment technique and bi-objective optimization methods to find low-risk and time (flight path) solutions. The methods are a network optimization approach that constructs and uses a graph to generate initial solutions. Those solutions are then improved by a local approach, a greedy approach, and a fourth method that did not use the network solutions. Of the four methods, the greedy approach yielded the best results.

## APPLICATIONS

- Determining optimal flight route for UAVs

## ADVANTAGES

- Can be extended to incorporate other factors such as shelter provided by buildings or other types of risk such as midair collisions

## CONTACT INFO

UM Ventures  
0134 Lee Building  
7809 Regents Drive  
College Park, MD 20742  
Email: [umdtechtransfer@umd.edu](mailto:umdtechtransfer@umd.edu)  
Phone: (301) 405-3947 | Fax: (301) 314-9502

## Additional Information

## INSTITUTION

University of Maryland, College Park

## CATEGORIES

- Software + Algorithm

## EXTERNAL RESOURCES

IS-2017-064