

## Method for Increasing Flight Duration and Speed in UAVs

Researchers at NASA's Armstrong Flight Research Center have patented a guidance and control method that allows unmanned aerial vehicles (UAVs) to detect and exploit buoyant plumes of air called thermals. Detecting and soaring in thermals enables UAVs to optimize flight performance, increase speed, extend flight duration and range, and reduce energy consumption. Although piloted gliders and low-powered aircraft have systems to detect thermals, Armstrong's guidance and control system is the first ever to be used by UAVs.

### Benefits

- **Reduces dependence on fossil fuels:** By exploiting thermals caused by convection in the lower atmosphere, this guidance and control method dramatically augments the UAV's primary propulsion system and conserves fuel.
- **Extends flight duration and range:** Armstrong's guidance and control method can extend the duration and range of aerial monitoring activities. For example, UAVs with a typical endurance of 2 hours can gain up to 12 hours of flight time.

### Applications

- Remote sensing
- Surveillance
- Atmospheric research
- Communications
- Firefighting
- Land management
- Law enforcement
- Border control

### Patent

Armstrong has one patent issued (U.S. Patent No: [7,431,243](#)→ ) for this technology.

### Commercial Opportunity

This technology is part of NASA's technology transfer program. The program seeks to stimulate development of commercial uses of NASA-developed technologies. NASA is flexible in its agreements, and opportunities exist for licensing and joint development. Armstrong is interested in a partnership to commercialize this technology.

### Contact Information

If you would like more information about this technology or about NASA's technology transfer program, please contact:

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