Non-Confidential Description: Working in conjunction with existing autopilot technology, the Low-altitude Laser Altimeter System (LA2S) enables autonomous precision landings of uncrewed aerial vehicles (UAVs) in unknown environments. The small, robust LA2S provides real-time altitude and platform attitude (i.e., roll and pitch) relative to the local terrain for altitudes of 10 m or less and attitude angles of 30 degrees or less.

Compared to existing methods, the self-contained LA2S offers superior reliability and functionality in low-altitude operations of 10 m or less. A camera is positioned between two laser illuminators—all aligned so that the laser beams and the camera's image field of view lie in a common plane. The second laser illuminator prevents distortion of baseline alignment that can occur from unknown variations in platform attitude or an inclined terrain. The LA2S microcomputer analyzes data and uses the look-up table (LUT), which is populated with values determined experimentally during a calibration process. Since the LUT approach involves less real-time processing, it would result in faster times between data collection and height and angle readings.

Applications: UAVs can quickly and inexpensively collect detailed data during forest fires, floods, or other events that would be too dangerous for manned missions. UAVs are used in a growing number of research, defense and homeland security, and commercial ventures, all of which could benefit from LA2S. Additionally, the system would help manned aircraft when visual cues are obscured or unreliable.

Benefits: LA2S provides real-time altitude and platform attitude relative to the local terrain for altitudes of 10 m or less and attitude angles of 30 degrees or less that are critical to autonomous precision landings of UAVs in unknown environments.

License: None

Confidential Disclosure Agreement: KU is willing to enter into a Confidential Disclosure Agreement for the purpose of negotiating a License Agreement. If you are interested in learning details of this invention, please contact Keith Braman, Director of Technology Commercialization, at kbbraman@ku.edu.

To see additional ITTC technologies available for licensing, go to www.ittc.ku.edu/techtransfer.

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