Dynamic Target Ranging With Multi-Tone Continuous Wave Lidar Using Phase Algorithm

Tech ID: 32470 / UC Case 2021-722-0

BRIEF DESCRIPTION

Researchers at the University of California, Irvine have developed a novel algorithm that is designed to be integrated with current multi-tone continuous wave (MTCW) lidar technology in order to enhance the capability of lidar to acquire range (distance) of fast-moving targets as well as simultaneous velocimetry measurements. This technology revolutionizes remote sensing by providing high precision, single-shot simultaneous ranging and velocimetry measurements without the need for sweeping.

SUGGESTED USES

- Automotive industry for self-driving vehicle navigation and safety systems.
- Atmospheric and topographic mapping for environmental monitoring and research.
- Aviation and aerospace for navigation and obstacle detection.
- Military and defense for surveillance and target tracking.
- Urban planning and infrastructure management.

FEATURES/BENEFITS

- Enables high precision, single-shot measurements without requiring sweeping.
- Capable of simultaneous range and velocity detection, enhancing efficiency.
- Less susceptible to interference effects compared to standard techniques.
- Scalable to any frequency of electromagnetic radiation, making it versatile for various applications.
- Eliminates the range limitations of standard coherent LIDAR techniques.
- Highly sensitive, providing cm-scale resolution at longer distances.
- Can be used as an independent positioning or navigation tool

TECHNOLOGY DESCRIPTION

The Multi-Tone Continuous Wave (MTCW) Lidar is an innovative technology that utilizes multiple radio frequency (RF) tones to emit a continuous wave signal, which, upon reflection from a target, enables the determination of the target's distance and speed. This method surpasses traditional LIDAR and RADAR techniques by eliminating the need for consecutive measurements and complex frequency or phase scans, facilitating faster, more accurate, and robust remote sensing capabilities

PATENT STATUS

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OTHER INFORMATION

CATEGORIZED AS

- **Optics and Photonics**
  - All Optics and Photonics
- **Computer**
  - Software
- **Imaging**
  - Remote Sensing
- **Security and Defense**
  - Screening/Imaging
- **Sensors & Instrumentation**
  - Analytical

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	12164020	12/10/2024	2021-722

STATE OF DEVELOPMENT

The researchers have performed numerical analysis and software simulations on the invention as well as initial experiments to determine the limits of the current MTCW lidars via performance testing on slow speed targets.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Silicon On Sapphire Based Plasmonic And Metasuraface Design For Optical Light Manipulation

» Environmental Sensors
» Other
» Position sensors
» **Transportation**
» Aerospace
» Automotive

RELATED CASES

2021-722-0

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