

WiMi Develops 3D Holographic LiDAR Diffuse Reflectance Target Detection Chip

HONG KONG, CHINA, January 4, 2023 /EINPresswire.com/ -- LiDAR (Light Detection And Ranging) is a relatively mature technology. With decades of laser LiDAR technology development, it gradually became more complex from scratch and combined with some new technologies to diversify multi-functional direction. WiMi Hologram Cloud, Inc. (NASDAQ:WIMI), the first share of holographic AR, has been committed to developing holographic technology research and application, and its leading 3D holographic laser LiDAR technology has been used in more and more unmanned and consumer electronics applications.

With the continuous development of laser LiDAR technology and more industry applications, laser LiDAR technology has also produced some technical nature defects, and the diffuse reflection problem is one of the key technical nodes. WiMi has developed a coherent 3D holographic LiDAR diffuse reflective target detection chip to solve the problem.

People know that the surface of many objects looks smooth, such as desktop walls, but they are not flat and messy under the magnifying glass, and light will be irregularly reflected in all directions by the rough surface. Laser LiDAR systems typically use laser pulses to scan and measure holographic 3D point locations in space relative to the sensor. Laser LiDAR systems can naturally emit thousands or tens of thousands of laser pulses per second, creating a holographic 3D point cloud of data. The diffuse reflection will lead to some deviation of the holographic 3D point cloud data, resulting in inaccurate or misjudged results, which is the diffuse reflection problem of the laser LiDAR system.

3D holographic laser LiDAR uses a pulsed laser with timely feedback or solid-state light to measure the point cloud space to reflect the object's spatial position. 3D holographic laser LiDAR system's characterization requirements can be adjusted to compensate for the diffuse reflection of the sensor's pulsed or solid-state level within a fuzzy emissivity dynamic range, which is the compensation adjustment of the spectral reflectance data in the complex environment characterization. The adjustment contains a series of complex algorithms, such as power compensation for laser LiDAR, point cloud data gain, and noise reduction. For example, substantial light interference. When LiDAR faces the sun's direction, if there is no suitable design processing system, it can easily lead to much apparent noise in the LiDAR point cloud. At the same time, the special diffuse reflection of particular objects also absorbs light waves, producing excellent point cloud data voids.

WiMi's coherent 3D holographic LiDAR diffuse reflectance target detection chip can perform spectral reflectance data judgment. Through complex algorithms, the characterization of objects with different reflectance under a wide range of complex environmental conditions is confirmed and combined with calibrated spectral reflectance data, precisely calibrated spectral reflectance. The laser LiDAR's range can be accurately measured to minimize interference with diffuse reflectance targets.

WiMi is also doing further technology validation and hopes that the technology base can assist the system of 3D holographic laser LiDAR and solve some other problems of laser LiDAR. For example, in the common trailing effect, laser LiDAR launch a pulse usually return, but in practice, the pulse signal has a certain dispersion angle, a large number of pulses often occur a pulse hit the front and rear two items, it will form two echoes, which will lead to distance discrimination error. Through the complex spectral reflectance data analysis of this point cloud data, LiDAR can accurately map the target area and calibrate the point cloud data. In addition, the interference of highly reflective objects with the point cloud data has been a technical difficulty for laser LiDAR. When laser LiDAR scans highly reflective objects, the output point cloud data may form another object of similar size and shape in other locations besides the actual site due to the mirror emission effect of highly reflective objects, causing a bad mirror image in the point cloud data. People hope to solve some of these problems plaguing laser LiDAR by the algorithm of coherent 3D holographic LiDAR diffuse reflection target detection.

People can see that traditional LiDAR has been popularized in the primary stage of autonomous driving (for example, the adaptive cruise control system of cars), which used to be configured only in high-end vehicles, but now it has almost become the standard equipment of most cars. The 3D holographic laser LiDAR technology can provide accurate feedback of spatial position and relative distance information to detect various objects and image them with spatial 3D holographic point cloud data, not only in the field of autonomous driving but also in terrain modeling, spatial measurement, disaster warning and many other fields required by space technology. If 3D holographic laser LiDAR is combined with XR (extended reality) technology, IoT technology, location and artificial intelligence machine learning (AI/ML), and advanced networks (5G/6G), more new industry applications may be born. So in the future, 3D holographic laser LiDAR technology still has a lot of room for technological progress and a broad application market.

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