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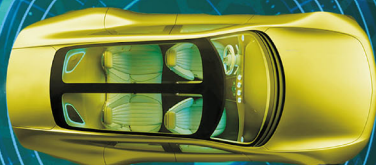
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Opto-Electronic Engineering

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光机电算智能一体化
引领探测感知新常态



中国科学院光电技术研究所

万方数据



中国光学学会

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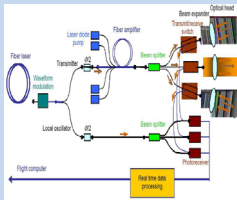
本期封面图片由天津大学
陈晓冬(190182)提供



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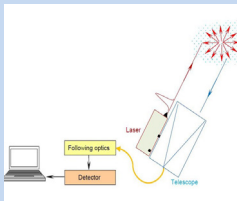
Review



- Basics and developments of frequency modulation continuous wave LiDAR** 190038

Lu Zhaoyu, Ge Chunfeng, Wang Zhaoying, Jia Dongfang, Yang Tianxin

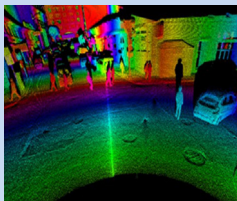
The basic principles of different LiDAR systems were introduced, the research work of FMCW LiDAR in the past ten years was classified into different types based on the light source scheme, and the features of various schemes were discussed.



- Review of advances in LiDAR detection and 3D imaging** 190167

Liu Bo, Yu Yang, Jiang Shuo

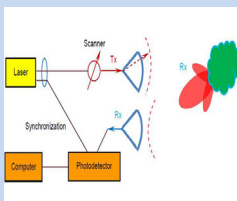
The principles of various LiDAR detection and 3D imaging systems were introduced, and the foreign and domestic development status of single point scanning, linear array sweeping and planar array 3D imaging LiDAR systems were summarized and sorted out.



- Key technology and application algorithm of intelligent driving vehicle LiDAR** 190182

Chen Xiaodong, Zhang Jiachen, Pang Weisong, Ai Dahang, Wang Yi, Cai Haiyu

By using LiDAR scanning method and related technology as the entry point, the key technologies of LiDAR hardware were introduced. And the principle, characteristics and current status of mechanical, hybrid and all-solid-state automotive LiDAR were discussed.

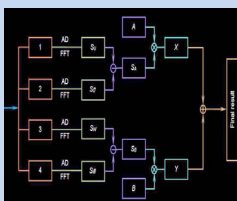


- Research progress in solid-state LiDAR** 190218

Chen Jingye, Shi Yaocheng

The transitional scheme from mechanical LiDAR to solid-state based on MEMS, and the principles of Flash and optical phased array LiDAR were introduced. The performances and open issues of the solutions for LiDAR were concluded.

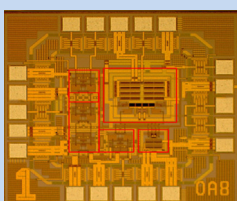
Article



- Research on coherent differential absorption LiDAR based on Golay coding technology** 190081

Hu Yihua, Dong Xiao, Zhao Nanxiang

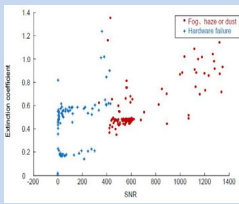
To improve the SNR and reduce the inversion error of CO₂, a coherent differential absorption LiDAR based on Golay coding was proposed and the corresponding decoding method was also studied.



- A high-performance CMOS FDMA for pulsed TOF imaging LADAR system** 190194

Jiang Yan, Liu Ruqing, Zhu Jingguo, Wang Yu

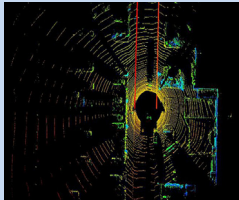
A high bandwidth and low noise fully differential main amplifier was presented for pulsed time-of-flight (TOF) imaging laser detection and ranging application (LADAR), which serves to amplify the small pulse echo signal.



Identification of hardware fault data of particle LiDAR
 Zheng Zhaoyang, Zhang Tianshu, Dong Yunsheng, Liu Yang

190100

According to the echo signal information of the echo shape and intensity of the LiDAR, the fuzzy logic algorithm was used to identify the fault data. The hardware fault data of the atmospheric particulate LiDAR was identified and tested.



LiDAR object detection based on optimized DBSCAN algorithm
 Cai Huaiyu, Chen Yanzhen, Zhuo Liran, Chen Xiaodong

180514

An optimized DBSCAN algorithm was proposed, which improves the adaptability under different distance by optimize the selection method of neighborhood radius. Compared with traditional DBSCAN algorithm, the positive detection rate of obstacle detection is increased by 17.52%.

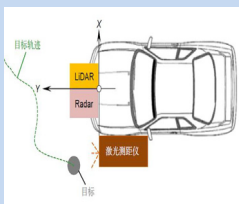


An object detection and tracking algorithm based on LiDAR and camera information fusion

180420

Chang Xin, Chen Xiaodong, Zhang Jiachen, Wang Yi, Cai Huaiyu

An object detection and tracking algorithm based on the LiDAR and camera information fusion was proposed. Compared with particle filtering algorithm, the average region overlap increased by 29.47% and the tracking success rate increased by 19.96%.



Target location estimation for vehicle dual radar based on unscented Kalman filter

180339

Xiang Yi, Wang Yi, Zhang Jiachen, Cai Huaiyu, Chen Xiaodong

An algorithm based on unscented Kalman filter was proposed to predict and update the position of the target based on the obtained radar data, which is used to estimate the target position of the unmanned vehicle dual radar system.



Ground segmentation from 3D point cloud using features of scanning line segments

180268

Cheng Ziyang, Ren Guoquan, Zhang Yin

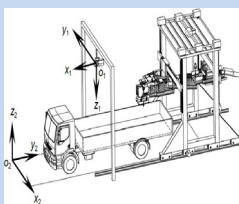
Aiming at the problem of accurately segmenting the ground in real-time from 3D LiDAR point cloud, a ground segmentation algorithm based on the features of scanning line segments was proposed.



Research on aircraft wake vortex recognition using AlexNet
 Pan Weijun, Duan Yingjie, Zhang Qiang, Wu Zhengyuan, Liu Haochen

190082

In order to solve the flight safety issues threatened by wake vortex of leading aircraft, an AlexNet convolutional neural network model algorithm was proposed to identify aircraft wake vortex.



LiDAR measurement system and the calibration method of loading robot

190002

Wang Chunmei, Huang Fengshan, Xue Ze

To carry out the measurement of vehicle body position and dimension of loading robot before loading, an intelligent vehicle body measurement system based on two-dimensional LiDAR was provided, and the calibration method of this system was studied as a key point.