应用光学 2008, 29(5) 693-696 DOI: ISSN: 1002-2082 CN: 61-1171/O4

论文

提高多光源汇聚光斑中心定位精度的形态学滤波方法

唐树刚[1];党丽萍[2];白波[3]

1.西安测绘研究所, 陕西 西安 710063; 2.西北工业大学 航空学院, 陕西 西安 710072; 3.中国人民解放军驻西光集团军代室, 陕西 西安 710043

摘要：

在激光指令传输中，为形成较大的光覆盖区域并增大光源的作用距离，将多个特性相同的激光器矩阵排列，构成组合光源。针对点阵多激光管光源在开放环境下成像光斑具有多个光能中心的特点，采用形态学滤波中的开启、闭合运算，去除背景噪声斑点，平滑光斑内部的小光斑叠加和干涉造成的不规则条、孔，使得能以简化的分割和定位算法，快速获得接近实际的完整光斑边界，光斑中心定位精度的均方差不大于1.2%。该方法能快速、高精度定位这种叠加光斑的中心，为远距离激光对准和测控提供了可靠的精度和时效保证。

关键词： 激光光斑中心 灰度 形态学滤波

Morphological filter algorithm to improve positioning accuracy of multi-laser convergent spot center

TANG Shu-gang[1];DANG Li-ping[2];BAI Bo[3]

1. Xi'an Institute of Surveying and Mapping, Xi'an 710063, China; 2. School of Aeronautical, Northwestern Polytechnical University, Xi'an 710072, China; 3. Military Representative Office Stationed in Xiguang Group, Xi'an 710043, China

Abstract:

In a laser command transmission application, many laser diodes with identical features are arranged in matrix to form a combined light source to achieve a bigger coverage area and longer range. Since the image spot emitted from the lattice multi-laser source has multiple energy centers in open space, the opening and closing calculation in the morphological filtering were used to remove the background noise spots, smooth irregular fringe and holes caused by the small spots overlap and interference. With this method, a full boundary similar to that of an actual image could be achieved with a simplified algorithm of segmentation and location. The mean square error for the position accuracy of the spot center is less than 1.2% in repeated measurements. The center of the overlapping spots can be rapidly and accurately located by this method. It provides the necessary accuracy and speed for laser alignment and measurement at long distance.

Keywords: laser spot center gray-scale morphological filtering

收稿日期 1900-01-01 修回日期 1900-01-01 网络版发布日期

DOI:

基金项目:

通讯作者: 党丽萍

作者简介:

参考文献：

本刊中的类似文章

文章评论 (请注意:本站实行文责自负, 请不要发表与学术无关的内容!评论内容不代表本站观点.)

反馈人		邮箱地址	

反馈标题		验证码	3385