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(81) 指定国(除另有指明, 要求每一种可提供的国家保护): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD,

(54) Title: CALIBRATION METHOD AND APPARATUS FOR EXTERNAL PARAMETERS OF LINEAR PROFILER AND ELECTRONIC DEVICE

(54) 发明名称: 一种线性轮廓仪外参的标定方法、装置及电子设备

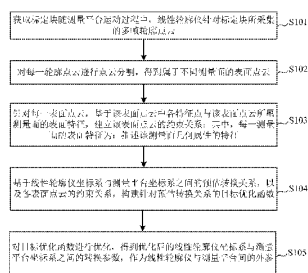


图 1

- S101 Obtain multiple frames of contour point clouds acquired by a linear profiler for a calibration block during the movement of the calibration block along with a measurement platform
- S102 Perform point cloud segmentation on each contour point cloud to obtain surface point clouds belonging to different measurement surfaces
- S103 For each surface point cloud, on the basis of feature points in the surface point cloud and the surface features of a measurement surface to which the surface point cloud belongs, establish a constraint relationship of the surface point cloud, wherein the surface features of each measurement surface are features for describing the geometric attributes of the measurement surface
- S104 On the basis of an estimated conversion relationship between a linear profiler coordinate system and a measurement platform coordinate system and the constraint relationships of the surface point clouds, construct a target optimization function for the estimated conversion relationship
- S105 Optimize the target optimization function to obtain optimized conversion parameters between the linear profiler coordinate system and the measurement platform coordinate system as external parameters between the linear profiler and the measurement platform

(57) Abstract: A calibration method and apparatus for external parameters of a linear profiler and an electronic device, which are applied to the technical field of measurements. The method comprises: obtaining multiple frames of contour point clouds acquired by a linear profiler for a calibration block during the movement of the calibration block along with a measurement platform (S101); performing point cloud segmentation on each contour point cloud to obtain surface point clouds belonging to different measurement surfaces (S102); for each surface point cloud, on the basis of feature points in the surface point cloud and the surface features of a measurement surface to which the surface point cloud belongs, establishing a constraint relationship of the surface point cloud (S103); on the basis of an estimated conversion relationship and the constraint relationships of the surface point clouds, constructing a target optimization function for the estimated conversion relationship (S104); and optimizing the target optimization function to obtain optimized conversion parameters between a linear profiler coordinate system and a measurement platform coordinate system as external parameters between the linear profiler and the measurement platform (S105). The calibration of the external parameters between the linear profiler and the measurement platform can be achieved.

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UA, UG, US, UZ, VC, VN, WS, ZA, ZM, ZW。

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(15) 更正内容:  
见 2024 年 1 月 4 日 (04.01.2024) 公布的公告

(57) 摘要: 一种线性轮廓仪外参的标定方法、装置及电子设备, 应用于测量技术领域。方法包括: 获取  
标定块随测量平台运动过程中, 线性轮廓仪针对标定块所采集的多帧轮廓点云 (S101), 并对每一轮廓  
点云进行点云分割, 得到属于不同测量面的表面点云 (S102), 以及针对每一表面点云, 基于表面点云  
中各特征点与表面点云所属测量面的表面特征, 建立表面点云的约束关系 (S103), 以及基于预估转换  
关系, 以及各表面点云的约束关系, 构建针对预估转换关系的目标优化函数 (S104), 以及对目标优化  
函数进行优化, 得到优化后的线性轮廓仪坐标系与测量平台坐标系之间的转换参数, 作为线性轮廓仪与  
测量平台间的外参 (S105)。可以实现对线性轮廓仪与测量平台之间的外参进行标定。