

陈涛涛,迟道才,梁 茜.基于矩形框几何校正的多叶面积测量方法[J].农业工程学报,2012,28(8):206-213

基于矩形框几何校正的多叶面积测量方法

Multi-leaf area measurement method based on geometric correction with rectangular box

投稿时间: 2011-07-03 最后修改时间: 2012-03-23

中文关键词: [测量](#),[图像处理](#),[几何学](#),[叶面积](#),[程序设计](#),[连通域扫描](#)

英文关键词: [measurements](#) [image processing](#) [geometry](#) [leaf area](#) [programming](#) [connecting regions scan](#)

基金项目:辽宁省重大项目(2008NY01);辽宁省自然科学基金项目(20082122)

作者	单位
陈涛涛	1. 沈阳农业大学水利学院, 沈阳 110866
迟道才	1. 沈阳农业大学水利学院, 沈阳 110866
梁 茜	2. 沈阳农业大学水稻所, 沈阳 110866

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中文摘要:

为了弥补逐片测量和图片倾斜失真的局限性, 该文提出了一种基于矩形框几何校正多叶面积测量方法(简称为GCCA)。GCCA法应用Hough变换提取矩形框, 对图像进行几何校正, 利用连通域扫描实现了多叶片同时测量。同时还利用Visual Basic 2010对GCCA法进行了软件开发, 并与坐标纸法、长宽系数法、Photoshop法进行了试验比较。试验结果表明: GCCA法是一种稳定性较高、相关性较好、适用范围较广的叶面积测量方法; 它继承了数字摄影图像处理法的优势, 是一种快速的植物叶面积测定方法。其测量速度随着单张图片叶片数量的增大而提高。软件的编制, 可消除人为因素的影响, 大大提高叶面积测量软件的互动性和通用性。GCCA法既可以应用于室内, 也可以进行室外无损测量, 为叶面积的测量提供了切实可行的新途径。

英文摘要:

In order to solve limitations of both leaf-by-leaf measurement and oblique distortion of digital image, this paper presents a multi-leaf area measurement method based on geometric correction with rectangular box (GCCA for short). The method extracts rectangle box using Hough transform, carries out geometric rectification, and enables Multi-leaf simultaneous measurement using connecting regions scan. At the same time this method is carried out by Visual Basic 2010 programming, and be compared with grid method, length-width method and Photoshop method respectively. Experimental results indicate that the GCCA method is a high stability method with great relevance to grid method and a broad applicable scope. Inheriting the advantages of digital photography image processing method, the GCCA method is also a rapid method for measurement of plant leaf area and its measurement speed increases as the number of leaves increases in a single image. Compilation of the software can eliminate the influence of human factors, and greatly improve the interactivity and versatility of leaf area measurement. GCCA method can be both applied to indoor and non-destructive measurement outdoor, providing a practical new approach for leaf area measurement.

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