博士论坛

基于数据回归建模的单目视觉测距算法

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摘要　　提出了一种基于数据回归建模的单目视觉测距算法，其基本思路与现有的"先建模再测距"的顺序思路不同，创新性地提出了"先测距再建模"的逆向思路，首先准确标定出一些距离样本点，然后采用数据回归建模的方法建立测距模型。该方法不用再单独考虑成像模型、成像系统误差、透镜畸变等带来的影响，而是在进行回归拟合时隐含地加以解决；同时，该方法不依赖于道路几何约束条件，既可用于高速公路等结构化公路情况，又可用于城区公路等非结构化公路情况。实验表明，该算法思路是有效的，能满足测距的实时性与精确性要求。

关键词　　智能汽车　单目视觉　数据回归　测距

分类号

Monocular vision distance detection algorithm based on data regression modeling

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Abstract

On the basis of detailed analysis of existent vision-based distance detection algorithm，this paper presents a monocular vision distance detection algorithm based on data regeression modeling.Differing from the existent strategy of "first modeling then detection"，this paper creatively presents a strategy of "first detection then modeling".Firstly，the method accurately calibrates a few distance samples，then applies data regression modeling to build the distance detection modeling.The method impliedly sloves the affections about imaging modeling，imaging system errors，lens distortion，etc.In the process of regression modeling，other than researches about these questions individually.In addition，the method is independent of the geometrical constraint of the lane，so the method not only can be applied to structed road such as freeway，but also to urban unstructed road.The experimental results show that the algorithm is effective，and satisfy the real-time and accurate requirements of distance detection.

Key words　　intelligent vehicle　monocular vision　data regression　distance detection

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