

工程与应用

## 室外机器人视觉导航的路径结构识别

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**摘要** 提出了基于路径结构特征识别的视觉导航算法, 以室外环境下导航路径图像为研究背景, 根据图像RGB颜色特征, 利用颜色聚类算法, 将导航路径从复杂背景中提取出来, 并检测出导航路径的中心离散点作为导航路径的基准点。当路径具有较明显的曲线特征时, 利用最小二乘法曲线拟合检测导航路径, 否则利用最小二乘法检测直线作为机器人的导航路径。实验结果表明: 该算法在导航路径具有复杂的结构特征等情况下有较好的导航效果。

**关键词** [视觉导航](#) [RGB颜色空间](#) [路径识别](#) [曲线检测](#)

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## Path recognition for vision-guided navigation of outdoor robot

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### Abstract

The paper describes a navigation system which is based on pattern classification of the navigation path. The environment images are analyzed in RGB vector space to study the feasibility of lane detection for outdoor robots. The navigation path is successfully recognized from the background. Perceptual color clustering and morphological image processing are used in preprocessing to obtain binary images and remove noise respectively. The guidance points are found from the average position information of the navigation path by progressive scanning. When the path has the obvious curve structure, the best guidance lane is located using least-squares curve-fitting, otherwise detecting the straight line as the navigation directrix. The experimental results demonstrate the effectiveness and the robustness of the approach.

**Key words** [vision navigation](#) [RGB vector space](#) [path recognition](#) [curve detection](#)

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