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论文与报告

# 基于激光束匹配和图模型的移动机器人相对运动估计误差分析

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**摘要**

提出激光束匹配问题中移动机器人相对运动估计误差的分析方法. 以概率图模型建模激光点几何特征, 构建链式成双条件随机场推理激光点关联的边缘概率. 通过对关联配置空间的节点和状态限定, 紧凑采样激光束匹配不确定性概率分布, 并映射于相对运动估计空间, 推理相对运动估计误差. 实验验证了算法的有效性.

**关键词** 激光束匹配 不确定性估计 条件随机场 图模型

**分类号**



# Quantification of Relative Movement Uncertainty Based on Laser Scan Matching and Graphical Model for Mobile Robot

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Abstract

The paper proposes an algorithm to quantify the relative movement uncertainty for mobile robot in laser scan matching. A number of geometry features are modeled with the probabilistic graphical model. A chain pairwise conditional random fields are employed to infer the marginal probability of the laser point associations. Furthermore, the uncertainty distribution is sampled compactly based on the node and state bounding. Then, the sampled uncertainty is mapped into the relative movement estimation space. Finally, the uncertainty of relative movement is inferred. Experiments demonstrate the validity of the proposed algorithm.

Key words Laser scan matching uncertainty quantification conditional random fields (CRFs) graphical model

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