

论文与报告

基于不确定性度量的多特征融合跟踪

顾鑫^{1,2}, 王海涛¹, 汪凌峰², 王颖², 陈如冰¹, 潘春洪²

- 1. 南京航空航天大学自动化学院 南京 210016;
- 2. 中国科学院自动化研究所模式识别国家重点实验室 北京 100190

收稿日期 2010-9-9 修回日期 2010-12-27 网络版发布日期 接受日期

摘要

提出了一种新的基于特征不确定性度量的多特征融合跟踪算法。首先, 针对粒子滤波跟踪算法中特征鉴别能力较弱且粒子分布相对分散时容易造成目标丢失的事实, 本文定义了一种新的特征不确定度量方法, 该度量可以在线调整不同类型特征对跟踪结果的贡献。同时, 针对乘性和加性特征融合跟踪算法方法中存在的缺陷, 提出了一种自适应的多特征融合方法, 融合的结果既突出了状态后验分布中目标真实状态对应的峰值, 又对噪声不敏感, 从而提高了目标跟踪的鲁棒性。各种场景下的实验结果比较表明: 新的融合跟踪算法比单特征跟踪、乘性融合跟踪和加性融合跟踪有着更好的稳定性和鲁棒性。

关键词 [目标跟踪](#) [不确定性度量](#) [粒子滤波](#) [多特征融合](#)

分类号

Fusing Multiple Features for Object Tracking Based on Uncertainty Measurement

GU Xin^{1,2}, WANG Hai-Tao¹, WANG Ling-Feng², WANG Ying², CHEN Ru-Bing¹, PAN Chun-Hong²

- 1. College of Automation, Nanjing University of Aeronautics and Astronautics, Nanjing 210016;
- 2. National Laboratory of Pattern Recognition, Institute of Automation, Chinese Academy of Sciences, Beijing 100190

Abstract

This paper presents a novel tracking algorithm that fuses multiple features based on feature uncertainty measurement. It is based on the fact that tracking failure of particle filter often happens in the cases of low discriminative abilities of the observed features and disperse distributions of the sampled particles. To handle this failure, we first define a new feature uncertainty measurement method to adaptively adjust the relative contributions of different features. Then we introduce a self-adaptive feature fusion strategy to overcome the shortcomings of product and sum fusion ones. This strategy effectively sharpens the distribution of the fused posterior, and makes the tracking less sensitive to noises. Thereby, the tracking robustness is improved. An extensive number of comparative experiments show that the proposed algorithm is more stable and robust than the single feature, multiplicative fusion, and additive fusion tracking algorithms.

Key words [Object tracking](#) [uncertainty measurement](#) [particle filter](#) [multiple features fusion](#)

DOI: 10.3724/SP.J.1004.2011.00550

通讯作者 顾鑫 xingu396@gmail.com

作者个人主页 顾鑫^{1,2}; 王海涛¹; 汪凌峰²; 王颖²; 陈如冰¹; 潘春洪²

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