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# 航拍视频帧间快速配准算法

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# Fast Interframe Registration Method in Aerial Videos

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## 摘要

为应对相机运动的影响,提出了一种快速有效的无人机(UAV)视频相邻帧图像配准算法。通过空间分布约束和角点量限制来筛选有效的FAST特征点,引入自适应阈值提高特征点检测的环境适应性,采用训练得到的不相关采样点集对特征点进行二值描述,以获得准确快速的特征描述,并通过最近邻算法根据汉明距离获得特征匹配对,最后运用RANSAC方法得到帧间仿射变换模型参数,消除相机运动带来的影响,为后续运动目标检测与跟踪提供保障。实验结果表明该算法快速、稳定,具有较高的环境适应性,能够满足无人机系统视频图像配准的要求。

关键词：　无人机　计算机视觉　航拍视频　图像配准　特征提取

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## Abstract：

To deal with the effect which is caused by camera moving, a fast and reliable image registration method between sequential frames for unmanned aerial vehicle (UAV) videos is proposed. Firstly, the stable FAST corners are selected via the constraints of spatial displacements and cornerness measurements. Meanwhile, an adaptive threshold method is involved in the feature detection process to improve environmental adaptability. Then, the binary descriptions of the detected features are generated by using the uncorrelated sample point set, which is obtained by training, and the matched points are established using the NN (Nearest Neighbor) algorithm based on hamming distances. Finally, the affine transformation parameters between adjacent frames are estimated using the matched points by RANSAC, which can be provided for further processing, such as moving object detection and tracking. Experimental results show that the proposed algorithm is fast and reliable, it has high environmental adaptability, and thus can meet the image registration requirements in UAV systems.

Keywords：　unmanned aerial vehicle　computer vision　aerial video　image registration　feature extraction

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