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### 基于序列图像的自动目标识别算法

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### Automatic Target Recognition Method Based on Sequential Images

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摘要

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**摘要** 由于利用单幅二维图像进行三维目标识别存在识别的多义性,提出了一种基于二维序列图像的三维目标自动识别算法。首先以修正的Hu不变矩构造目标的图像识别特征,进而采用BP神经网络分类器构造关于目标融合识别的基本置信指派函数,以神经网络的训练误差构造证据理论不确定性度量,采用基于吸收法的DS证据理论实现高冲突证据的贯序式融合。对各姿态飞机图像识别的仿真表明,该算法对飞机的空间姿态变化具有很强的鲁棒性,能快速地准确识别飞机类型。此外,算法对先验性参数具有一定的鲁棒性。

**关键词:** 图像目标识别 数据融合 DS证据理论 序列图像 BP神经网络

**Abstract:** It is much difficult to recognize a 3D target just based on a single 2D target image because of the multivocal information. In this paper, an automatic target recognition method based on sequential 2D images is proposed. Firstly, the modified Hu invariant moments are used as the invariant characteristic vectors, which are further inputed to a back-propagation neural network (BPNN) classifier. Then the BPNN classifier gives the primary recognition result, which is combined with the training error to achieve the basic belief assignment (BBA). Finally, a revised Dempster-Shafer (DS) reasoning method named absorption method, which can deal with high conflicting evidences, is applied to implement the final reasoning decision. The simulation based on multiple aircraft images with various attitudes demonstrates that the proposed method can recognize the aircrafts quickly and accurately. Besides this, this method has strong robustness to a priori parameter and the attitude variety of aircraft images.

**Keywords:** image recognition data fusion DS evidence reasoning sequential image BP neural network

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