基于三维动态特征的运动状态识别方法研究

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摘 要：提出基于三维动态特征的运动状态识别方法. 首先采用一种星型骨架组成结构揭示人体三维运动模式，利用 GMM 得到图像序列的前景图片，运用 ISOMAP 非线性算法的降维方法来取得低维数据子空间，把运动姿态三维数据投影到非线性流型低维子空间中，识别出运动状态的内在结构后分别研究人体运动的各个关节点，最后通过集成学习的方法生成隐马尔科夫学习器达到自动识别运动状态目的. 仿真实验结果表明，提出方法的识别速度和精度对比传统方法有明显提高，证实了研究方法的可行性.

关键词：三维动态特征；星型骨架；GMM；ISOMAP；非线性流低维子空间；隐马尔科夫学习器
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Motion State Recognition Method Based on 3d Dynamic Characteristics Research

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Abstract: Propose a motion state recognition method based on 3 d dynamic characteristics, first USES a star skeleton structure characterization of the human body 3 d motion, through GMM for image sequence foreground image, ISOMAP nonlinear dimension reduction of manifold learning method is used to generate a low dimensional data subspace, the motion of 3 d data projection to nonlinear flow pattern in the low-dimensional subspace, and identify the motion state of inner structure of human body movement is conducted for each key points of the study, based on the integration of learning have hidden markov study so that can be used to automatically identify the motion state. The simulation experimental results show that the recognition speed and accuracy of this method compared to traditional methods have obvious improve, confirmed the feasibility of research method.

Key words: three-dimensional dynamic characteristics; star skeleton; GMM; ISOMAP; a nonlinear flow low-dimensional subspace; hidden markov learning

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