Abstract

Learning a new skill for physical development can be a daunting task for many novice persons. To support such learners, an intelligent system is required to guide them in the learning process. In this paper, as first part of such a system, we propose a feature detection and tracking algorithm that can be used during rope skipping skill development using color processing and the particle filter. The data used is captured using a camera placed on the side of the learner. The learner wears markers on the head, hands and ankles; a marker is also
attached on the rope to capture rope rotation. Initial point detection is achieved using HSV color space thresholding. The particle filter is then used to track these features especially because of misdetections due to noise and blurring due to rope speed. In this work, the rope skill attempted is the learning to do the "double under" jump. A "double under" jump is defined as completing two rope rotations per jump. Experimental results prove that this is an effective method for accurate feature detection and tracking.

References

- Particle_filter, https://en.wikipedia.org/wiki/Particle_filter (last modified on 21 October 2016)

Index Terms

Computer Science  Image Processing

Keywords

Motor Skill  Particle Filter  Learning Support  Curve Fitting