

# Sports Intervention Strategies for Young Children's Poor Posture Based on Video Surveillance and Torso Recognition Algorithm

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**Abstract:** This article proposes a movement intervention strategy for young children's bad posture based on video surveillance and torso recognition algorithms, which solves the situation of similar but not identical actions of different people in monitoring, effectively solves the problem of non-fixed speed behavior classification, and can better perform behavioral classification tasks. Before children's gymnastics intervention, the control group ( $10.12 \pm 2.97$ ) and the experimental group ( $8.97 \pm 2.72$ ) had no significant difference in gross movement scores ( $F=0.933$ ,  $P>0.05$ ); After the intervention of children's gymnastics exercise, the control group ( $12.69 \pm 3.08$ ) and the experimental group ( $15.32 \pm 3.11$ ) have higher gross movement scores than before the intervention (t values are -2.346, -2, respectively) 021, P values are all  $<0.05$ ).

**Keywords:** Sports Intervention Strategies, Young Children, Poor Posture, Video Surveillance

## 1. INTRODUCTION

Symptoms of ADHD: Inattentive or Attention-deficit; too much activity (hyperactive or hyperkinetic); impulsive. Based on the advantages of the above three symptoms, ADHD is subdivided into three categories: mainly inattentive, mainly hyperactive impulsive, and combination. Attention deficit hyperactivity disorder (ADHD) often manifests as: 1. Attention disorder [1]. Children show obvious difficulty in concentration and attention, which is not consistent with their age, and the attention [2] duration is short; they often have difficulty maintaining attention in class, doing homework or participating in other school activities, and are easily distracted by external stimuli and influences; Often reluctant to complete tasks that require [3] a long time to concentrate; doing things procrastinating, likes to be sluggish, difficult to complete homework on time or assigned tasks assigned by teachers and parents; often carelessly making mistakes in learning or activities, easy to miss and forget about daily activities.

3 to 6-year-old children mainly perform gross movements. The practice of gross movements during this period can not only promote the development of fine movements, but also promote the learning of more complex motor skills, and the development of children's cognition, emotions, and social behaviors. All have important influence. Gallahue et al. [4] clearly pointed out that physical education can improve the cognition [5] of motor skills and enhance physical ability. Children's physical education is an important foundation for the development of physical education [6].

Poor impulse control ability [7]. It is often manifested as doing things without regard to the consequences, acting impulsively, acting with momentary [8] interest; often interrupting others when others are speaking [9], and rushing to answer questions when the teacher asks; unable to wait patiently in line [10]; Yi has disputes or even fights with his peers. 3. Hyperactivity. Children with ADHD often have more small movements and appear very restless. It is difficult for them to sit quietly in the classroom for a long time. They often move around in their seats [11], keep their hands and

feet busy, and even leave their seats and run around without authorization. In addition to the most significant representative manifestations above, the main manifestations of ADHD patients may also include the following aspects: behavioral difficulties; abnormal sensory function; conduct problems; social problems and [12] emotional problems. Exercise intervention is recommended as an auxiliary or complementary method to treat ADHD. It is a safe and effective method especially for children. It has a positive impact on children's cognitive behavior, but the exact mechanism is not yet clear. Both exercise intervention and stimulant drugs affect the dopaminergic and noradrenergic systems, and their mechanisms for the treatment of ADHD are similar [13].

Specifically, exercise intervention can promote neurotransmitter (such as dopamine, serotonin, norepinephrine) and neurotrophic factor levels [14]. The increase of dopamine level indirectly affects the children's attention and learning ability, while the increase of norepinephrine level improves the children's performance [15], distraction, arousal regulation and memory ability; brain-derived neurotrophic factor is a normal brain an important element in development is a strong regulator of neurosynaptic [16] transmission and plasticity. Regular physical exercise can promote a significant increase in the content of this factor [17], which is conducive to improving the behavior and cognition of children. Intelligent video Surveillance is poor [18] is a new data processing technology that combines video surveillance and computer vision. Its advantage is that it can process, analyze and understand the sequence images collected by the camera without increasing manual intervention [19]. This technology automatically analyzes and detects the targets in the sequence to achieve target tracking while completing [20] corresponding behavior analysis. When an abnormal situation occurs, the intelligent video surveillance system can not [21] only provide early warning information in a timely manner to ensure a low rate of false alarms and false alarms [22], but also assist relevant personnel in dealing with the abnormal situation in the monitoring scene in real time [23].

The analysis of abnormal behaviors of moving human bodies is based on intelligent video surveillance [24], using computer vision technology, networked and intelligent as the development direction, to analyze and identify human target behaviors in video sequences, so as to deal with abnormal behaviors in time and give alarms in time. For the purpose, the ability of video surveillance is greatly improved, and manpower and material resources are saved in the monitoring work.

## 2. THE PROPOSED METHODOLOGY

### 2.1 The Intelligent Video Surveillance

Video is an image that is combined according to a certain coding standard and changes with time. A video image is a continuous and interrelated multi-frame image, also called a dynamic image or a sequence image, and an image usually refers to a static image. According to the principle of human vision persistence, when the continuous image changes more than 24 frames per second (line hoe e) image, the multi-frame image seen by the human eye is continuous and smooth, and it is impossible to distinguish a single frame image. Such related and continuous images are defined as videos.

Under normal circumstances, the image quality will be reduced during the shooting, transmission and conversion of the image sequence. Therefore, there are two ways to improve the degraded image: one is to ignore the cause of the degraded image quality, to highlight the effective information selectively, and to attenuate the invalid information. This method highlights the main characteristics of the target through grayscale transformation, filtering and denoising, and attenuates impurity noise, which can improve the readability of the image, that is, image enhancement technology; the other is to compensate for the cause of image degradation, and compensate for the cause of degradation. Making the image as close to the original image as possible. The key to this method is to improve image quality, that is, image restoration. At present, many researches have been done based on PF tracking, but they mainly focus on the estimation of prior distribution, the calculation of importance weights, and the study of importance functions. The selection of particles is mostly based on a specific range or manual selection. Therefore, automatic tracking of pedestrians in an intelligent monitoring system is difficult to be practical. In addition, the selection of the human tracking area will affect the accuracy and complexity of the tracking algorithm. This section proposes an algorithm to automatically select the coverage ratio of the largest characteristic area to determine the tracking area.

When modeling a target based on color features, a rectangular or elliptical area is usually selected as the tracking area, and a reasonable color model is selected for the target area to determine the characteristics of the moving target. The contour shape of the human body is an irregular shape.

### 2.2 The Torso Recognition Algorithm

Multi-objective joint point estimation method is used to extract joint points from members of the group behavior. In order to describe the actions of group members completely, 14 joint points are extracted from the group members in the image. These joint points are: head, neck, left shoulder, right shoulder, left time, right shot, left hand, right hand, left body, right marrow, left knee, right knee, left foot, and right foot. Group behavior recognition is different from individual behavior recognition. It not only includes the recognition of individual behaviors, but also involves the correlation and

relative effects between group members. These are closely related to form an overall structure. Therefore, feature extraction for group members' behavior is essential. For a sample formed by joints of multiple people, it is similar to a social network formed by nodes and relationships.

In the research field of social networks, individual members or other social things in the network are treated as nodes. In social networks, the relationship between members becomes a connection between nodes.

### 2.3 The Exercise Intervention Strategy for Young Children's Poor Posture Based on Trunk Recognition Algorithm

Exercise intervention is mainly divided into aerobic exercise and anaerobic exercise. Aerobic exercises include jogging, cycling, dancing and treadmill exercises, which can increase the heart rate of children and stimulate sweating. Chronic aerobic exercise may help improve children's intelligence, cognitive ability and academic performance. Non-aerobic exercise is also related to the improvement of children's physical and cognitive abilities. Compared with aerobic exercise, the acceptance of anaerobic exercise (sprinting, long jump) is lower, and many children will feel resistance, and there are few studies on the intervention of anaerobic exercise in children with ADHD. Aerobic exercise has an effect on the cognitive function of children with ADHD. Have a higher positive impact. ADHD children's response inhibition, cognitive control, attention distribution, cognitive flexibility, processing speed and vigilance have been improved after exercise intervention.

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## 3. CONCLUSIONS

The detection of abnormal behaviors of moving human bodies in intelligent video surveillance saves a lot of manpower and material resources, is real-time and minimizes the false alarm rate and the false alarm rate. The results of this research show that children's gymnastics can effectively promote the development of displacement and material-controlled movements, enhance the ability to perform gross movements, and lay a good foundation for the learning of movement skills and the development of physical qualities such as flexibility, strength, and balance; according to the evaluation results of TGMD-2 , Improve the gymnastics arrangement, apply it to children's gymnastics teaching, and observe the long-term synergistic improvement effect on children's movement development and physical fitness.

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