

Comparative Take a Look At On Marker Based Totally and Marker Much Less Based Motion Capture Technology Using In the Kinematics of Yoga Posture

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Abstract -The usage of the 3-d (3-dimensional) technique can discover the human movement of kinematics in bio mechanics. The marker primarily based three-D technique is definitely too established of the longest process possibility precision and manufacturing of the while required. But the based Marker less 3-d device human motion to capture systems may offer a faster motion evaluation, let for less time required, however the differences among information captured in every device is uncertain.

Goal- The marker much less and marker based machine is akin to the 5 exceptional forms of status and sitting yoga postures can be calculated joint angles in kinematics in exclusive yoga posture and discover the middle of mass and middle of pressure in that yoga posture of the human body.

Technique- A yoga posture, motion determined through first taking pictures video streams of the human movement, then constructing 3-d Representations of the subject in the type of joint perspective labeling individual frame center of mass and joint angle for extracting Human body kinematics, in comparison records acquired from the marker-much less systems with facts acquired from marker-primarily based movement capture machine.

Result- comparing the yoga posture to locate the special attitude fee and find the center of strain within the frame in marker primarily based and marker much less based gadget.

Dialogue- The range of changing within the different yoga posture can be calculated in the angle and discover the center of strain in the human body. Supplying this examine is that the evidence of the report is just like marker based and marker much less primarily based machine.

Key-word-3D (three-dimensional), kinematics, center of mass, middle of stress, marker much less, marker based

I. INTRODUCTION

Bio-mechanics uses kinetic strategies for organs, cells and cell organisms at any level of the entire organism, and is the look at of the shape, feature and body-movement of organic systems [1]. Enjoyment, the primary subject of virtual animation for biomechanical evaluation and programs for sports and remedy can be widely used to movement capture strategies. With photograph based motion capture technology is the network of biomechanics has been growing the interest of the previous few years, computer vision and in the entertainment enterprise of growing especially in this discipline.

Three-dimensional kinematic measures are taken into consideration due to the fact the non-invasive gold trendy of motion analysis [2]. Those structures Are accustomed look at gait and carrying motion [3–5]. Marker based totally systems offer legitimate kinematic records, but are time ingesting to installation and system facts [6], proscribing their use in large studies. In comparison, marker much less machine requires much less player guidance and records processing time. The purpose of this paper the marker less and marker primarily based system is as compared to the, distinctive type of yoga postures may be calculated joint angles in kinematics in special yoga posture and discover the middle of mass and middle of stress in that yoga posture of the human body. Amassed using a marker less movement gadget with respect to a marker-based record series protocol.

II. APPROACH

First capturing the video streams in determining the human motion, then constructing 3-d representations of the numerous yoga postures and calculated the angle value of particular posture inside the middle of strain and center of mass in frame segments of the Human body kinematics. They facts obtained from the marker much less structures with statistics received from marker-primarily based movement seize system is may be in comparison.

2.1 Marker-Much less Motion Capture System

The marker-less motion capture device is their gathered the video movement machine to capture the five special standing postures and sitting yoga postures in 4 practitioners. They've reordered to height and weight. They practitioners wore to a fitted blue quick, sleeved shirt, geared up black long pants and orange sleeved. The practitioners do the postures in extraordinary asana they have calculated in angle values in joint attitude, hip, knee the usage of kinematic and middle of strain to the asana and discover the middle of mass to the posture. A 3-dimensional motion of the practitioner shape became captured joint center region is based totally on weight and peak is the percentage of values to be gift inside the joints at a point of standing posture and similarly is to present within the middle of strain in that posture[7]. The facts could be stored to file of DARI (Dynamic Athletics, Vault software model 3.2); the kinematic tool end result is to be stored the produce the software of biomechanical analytics. The joint angles and middle of stress statistics to be exported to statistics in Excel. Machine gaining knowledge of techniques can be carried out to the method of human movement. In SVM strategies can be used to categories records to learn in mastering models.

2.2 Marker Based Totally Movement Capture System

The marker based totally is appearing in yoga for standing posture. The ten digicam Vicon machine is used to capture the practitioner. The height, weight has been recorded in modifying the Helen Hays marker set can be used, and anthropometric measures may be recorded and that they reflective markers can observe to the pores and skin [8]. The affected person does the yoga posture. Kinematics and middle of stress captured using a BTS clever-D device. The marker will be set in full body to offer via using of the BTS machine (Table 1). The middle of strain is just too received for the right leg and the preprocess turned into accomplished with the smart tracker and clever analyzer software program. The kinematic information sample at 100HZ, the usage of to the software program Vicon nexus 2.2. The hip joint is estimated to used to the Symmetrical middle of Rotation estimation [9] and the knee joint is anticipated to use to the Symmetrical Axis of Rotation analysis. The information will shop to be exported to the polygon. The gadget used to the technique of lively versus passive markers. This technique is used to the commercial motion seize machine.

Frame Section	Anatomic Points
Head	significant factor of head
R ,1 head	facet of the top
Nasion	Nasal bone
R,1 up arm	Arms
R,1 elbow	Humerous epicondyles
Hand	1/3 metacarpal
Heel	Heels
R,1 bar 1	Thigh
Hip	Hip

Table 1 Marker Set of Anatomical Factors within the Human Body

III.RESULTS AND DISCUSSION:

Four practitioners (2 female 2 men) age=26±four years, top=1.73±0.05 m, weight=71.9±12 kg. The practitioners doing yoga postures in 10 seconds of live in the status posture and sitting posture after stabilization in the all biomechanical statistics to be received. The system is described as X-axis pointing ahead, y-axis is top put up and z-axis is to the proper. To find the middle of strain at the human frame all through the posture. Practitioners to complete the task of kinematic attitude values in joint perspective (hip, knee, legs). No matter the strongest courting between systems on the hip inside the yoga posture, average RMS error became additionally the most important, indicating an absolute discrepancy among the two systems (Table 2). As soon as normalized to joint range of movement, RMS mistakes had been biggest on the hip within the posture, indicating a probable difficulty in figuring out joint angle values in kinematics.

Movement	Center of pressure	Vicon	RMS (Root mean square)	Normalized RMS Error
Chair pose	Thigh	0.91 0.94	23.0	0.39
Eagle pose	Knee	0.92 0.89	11.5	0.15
Big toe pose	Knee	0.98 0.92	12.7	0.25
Downward facing dog	Hip	0.67 0.92	10.6	0.35
Extended side angle pose	Hip	0.37 0.01	18.0	0.45

Table 2 Posture Movement of Attitude Values in Joint Perspective

IV. CONCLUSION

The contrast of two strategies in marker based totally and marker much less based totally gadget with kinematic perspective cost in human motion. The marker based technique using the method lively verse passive and marker much less methods using the method in device getting to know. The joint angle value calculates in hip, knee, leg to be as compared. But the marker much less movement gadget presents less difficult approach of movement analysis. This approach of coaching time is less and the practitioner will don't have any disturbance doing yoga postures.

Destiny paintings to use marker less motion device to evaluate day after day yoga posture in institution of practitioners.

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