TRACKING MOVING OBJECTS AND

RECONSTRUCTION IN 3D SPACE

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There are many applications where motion in a 3D space has to be captured and reconstructed. For example, when creating 3D animated movies, in order to give more natural movements, 3D motion tracking is used. Also, in computerized ball tracking systems, to find the accurate trajectory of the ball, reconstruction of the captured motion is an essential task. Some applications use sensors attached to the moving object to capture them whereas some applications use number of cameras to capture the path of the object. This report presents a method to capture moving objects in a 3D space using two digital video cameras and studies the possibility of applying a Neural Network or a Kalman Filter to convert 2D image coordinates into relevant 3D coordinates for reconstruction of the object in 3D space.

A laboratory setup was constructed to acquire video sequences using two cameras set with lines of sight are right angle to each other. The acquired video sequences are then loaded to a PC with high processing capacity. A software has been developed to extract the frames of video sequence and to locate the object in each image using cross correlation pattern matching. The resultant image coordinates are then used to train an Artificial Neural Network (ANN).The ANN estimates the 3D coordinates of the object using 2D coordinates generated by two cameras. The possibility of using Kalman Filter technique in object tracking is also investigated. The results obtained shows that the accuracy and speed of the method depends on the processing capacity of the devices and the software tools used.