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Positive effects can be achieved by continuously performing preventive care and other medical activities , but performing the same activities every day can be a cause of mental strain . Therefore , research has been conducted to encourage the use of the motor system by maintaining the motivation of users and incorporating games that users can voluntarily engage in . The Kinect system developed by Microsoft is capable of recognizing the posture of a person and the three-dimensional coordinates of his or her joints , and research and development of a system that uses Kinect to measure limb movements for rehabilitation purposes is underway . Kinect can detect real-world human postures and can therefore also be used to recognize antagonistic movements . Recently , several Kinect-compliant commercial rehabilitation systems have been developed . We previously designed and developed a prototype lower limb chair motion support system using depth image sensors to evaluate its performance and ease of use . The system recognizes and evaluates motion based on 3D positional data and joint angles in skeletal and RGB data acquired from Kinect sensors . In this study , we designed , implemented , and evaluated a system that aids antagonistic movement using depth sensors . The system uses skeletal data on the user 's joints acquired from depth sensors to recognize movement and assess user movement to provide immediate feedback . In addition , we use an audiovisual display to explain the exercise procedure to the user and to play the immediate real-time video to encourage movement . The system also has a rhythm game function that allows users to adjust their movements to music . The system includes four types of exercises : upper/lower limb antagonism , upper left/right limb antagonism , soaking rock paper scissors with both arms and legs , and biceps/triple double time triple time exercise .

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