

## Development of a Game Based Static Balance Training System for Aged People



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**Keywords:** Static Balance, Physiotherapy, Log Details

**Abstract:**

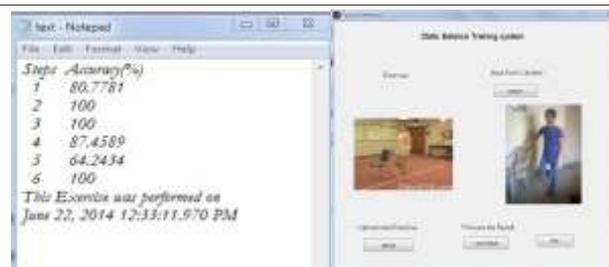
Static balance is one of the main factors for falling in older adults. It is also a major reason for premature death in older adults. Reason for poor static balance is the lack of physical and mental activities. Lack of attention towards static balance can lead to severe issues in older adults such as incorrect posture, increased rate of falling and immobility. Conventionally static balance can be improved by performing the exercises prescribed by the physiotherapist. There are a few virtual training systems available in the market for older adults to help them improve their static balance. But the existing systems are implemented with the help of VR devices that are unaffordable as their cost is very high.

In this project, an attempt is made to develop a game based static training system for aged people. Since webcam is a commonly available capturing device the motion capture algorithm is designed and developed for it using MATLAB. The game consists of three levels namely Beginner, Intermediate and Expert. The user is also assisted with a Tutorial level for practising the exercises. As the static balance disorder is mainly caused in people over the age of 65, simple game levels are designed with a combination of physical exercises and mental imagery. The system is further implemented to store the statistic details of the exercises performed by the patient/user. Physiotherapists can view the patient's progress as well as upload new exercises to the system.

The training system is tested for its functionality with the help of defined test cases and found that it is working according to the requirements defined. The game is further tested with three participants for different levels of the game. If the set of exercises in the game are performed by the older adults for over a period of 9 weeks it can increase their static balance.



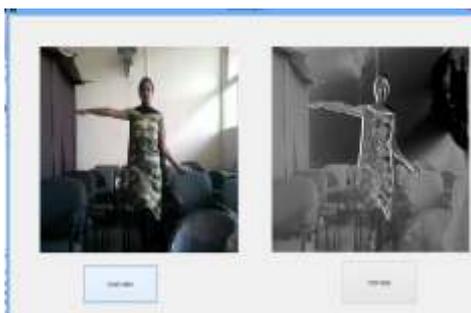
**Game play level**



**Tutorial level**



**Game menu**



**Captured motion**



**Image conversion**