Design of a Computer Vision Based Exercise Video Game for Senior Citizens

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Abstract : There are numerous changes, both mental and physical, taking place when people age. We need to understand the different aspects required for healthy living, including meeting nutritional needs, regular physical activities to keep agility, sufficient rest and sleep to have physical and mental well-being, social engagement to avoid the risk of social isolation and depression, and access to healthcare to detect and manage chronic conditions. Promoting physical activities for an ageing population is necessary as many may have enjoyed sedentary lifestyles for some time. In our study, we evaluate the considerations when designing a computer vision video game for the elderly. We need to design some low-impact activities, such as stretching and gentle movements, because some elderly individuals may have joint pains or mobility issues. The exercise game should consist of simple movements that are easy to follow and remember. It should be fun and enjoyable so that they can be motivated to do some exercise. Social engagement can keep the elderly motivated and competitive, and they are more willing to engage in game exercises. Elderly citizens can compare their game scores and try to improve them. We propose a computer vision-based video game for the elderly that will capture and track the movement of the elderly hand pushing a ball on the screen into a circle. It can be easily set up using a PC laptop with a webcam. Our video game adhered to the design framework we employed, and it encompassed ease of use, a simple graphical interface, easy-to-play game exercise, and fun gameplay.