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The mechanical background of devices for balancing skill development

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Abstract: In the studies dealing with the analyses of balancing, the falling in elderly age is mentioned as the main motivation. It can be considered as a generation problem in our aging society. Besides, the motion therapy is another important field, where the understanding of the mechanism of balancing can help. In our society the number of premature babies is increasing, many of them requires intensive motion therapy. The natural learning of different motions and upright standing is a really long process during infancy and childhood. In case of children with dyspraxia or other disabilities the learning process has to be assisted and accelerated. Most of the balancing improvement trainings are based on simple devices like the balance board, the Bosu ball or the Huple which is a Hungarian development especially for children. By means of the destabilization effect, these devices make the upright standing harder, which is not simple anyway. One can feel that standing on one of these devices is much more unstable and requires high concentration. The aim of this is work is to analyse the mechanical background of this problem and verify the usability of these devices with motion capturing. By using engineering approaches, quantitative performance measures are introduced, which assist the mainly visual observation based existing scoring systems. The proposed process utilizes the mechanical model of the human and the balancing device.

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