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# A Study of Samba Dance Using Acceleration Sensors

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In this thesis, we study a skill acquisition process of samba dancing. Samba dancing is a good example of rhythmical motor skills where a subject must learn a novel type of coordination pattern among body parts. We investigated the acquisition process by employing 30 subjects for ten months whom we asked to participate weekly dance lessons. We measured acceleration of their movements. We installed a wireless acceleration sensor at the back of lumbar. Sampling rate is 200Hz. In addition to 30 subjects, as a reference, we measured the movements of the instructor. We analyzed collected data by evaluating autocorrelation and frequency analyses. Analysis of autocorrelation of the subjects' vertical movements revealed that many subjects learned to keep a correct tempo of music during six months. The ability of moving body in the tempo is thought to form a basis for dancing. We also found that several subjects showed accent of rhythm, which is necessary for samba. In visual observation, their performances were better than the others. We expect that there are dual stages of skill acquisition process of samba dancing: tempo and accent. We also measured acceleration of the arm movement of playing the shaker while subject is dancing. We found that several subjects showed accent of rhythm on playing the shaker as well as case of dancing by analysis of autocorrelation. Additionally, all subject who has accent in the arm has accent in the lumbar. We expect that showing accent by dancing is necessary to show accent by playing the shaker.