

立体映像と酔い

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Motion sickness induced by stereoscopic images

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Abstract: Often, people travelling in ships, trains, aircraft, and cars tend to experience motion sickness. It has been reported that even users of virtual environments and entertainment systems experience motion sickness. This visually induced motion sickness (VIMS) is known to be caused by sensory conflict, for instance, the disagreement between vergence and visual accommodation, while observing stereoscopic images. VIMS can be measured by psychological and physiological methods. The simulator sickness questionnaire (SSQ) is a well-known method that is used herein for verifying the occurrence of VIMS. We also quantitatively measure the sway of the centre of gravity of the human body before and during the exposure to several types of movies (that we exhibit in this symposium). During the measurement, subjects are instructed to maintain the Romberg posture for the first 60 s and a wide stance (with midlines of heels 20 cm apart) for the next 60 s. The centre of gravity is projected on a plane which is parallel to the ground. The body sway is recorded as a stabilogram on the plane. According to previous researches, a stochastic process is regarded as a mathematical model that generates stabilograms. We propose a method to obtain stochastic differential equations (SDEs) as a mathematical model of the body sway on the basis of the stabilogram. While there are several minimal points of the temporally averaged potential function involved in the SDEs, the wide stance decrease the gradient of the potential function. We have succeeded in estimating the decrease in the gradient of the potential function by using an index called sparse density.

Keywords: Visually induced motion sickness (VIMS), Stabilometry, Sparse Density, Stochastic Differential equation (SDE), Potential