

The Sleighing Simulator 2.0

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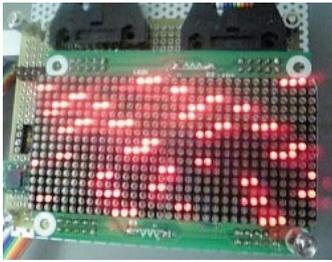


Figure 1: The sample image of the LED-matrix-array

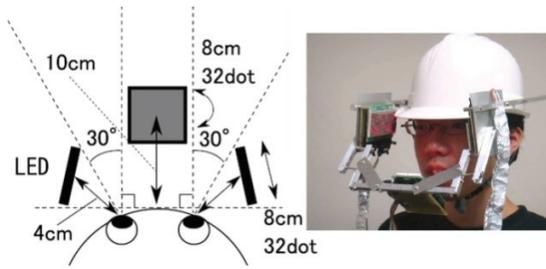


Figure 2: The physical of prototype system



Figure 3: The image from user's point of view

1. Introduction

The speed sensation is one of the important factors that affect pleasantness for users of entertainment system such as motion ride, etc. Motion ride is a kind of entertainment systems, which is equipped with motion platform. Motion platforms are effective system to improve users' sense of "motion". If users of the motion platform want more sense of "motion", the movement of the system should become harder. Consequently, the system may become more harmful to users.

The sense of "motion" is mainly consists of the speed sensation and the acceleration sensation. Motion platforms are the display systems for the acceleration sensation. The speed sensation is mainly provided by the visual information from conventional visual displays which are often placed in front of users. It is well known that information from peripheral vision strongly affects the sense of speed and human sense of self-motion [Gerhard et al. 1972]. However, such conventional visual displays are often having insufficient field of view to stimulate the user's peripheral vision. By using large size display may become an easy way to solve that problem. Actually, the size of display has been increasing but the price of such displays has been decreasing these days. In spite of this fact, it is still not easy for many private consumers to equip with CAVE like system to increase FOV of display system. Large cost and wide space is required to setup such system, which is hard to cover by average private consumers.

In our previous research, we have proposed a system called "the peripheral display". That is the system for augmentation of the sense of speed in a cost effective and in a safe way [TAKUYA et al. 2007]. In this paper, we introduce application system named The Sleighing Simulator 2.0.

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2. System Development

Our peripheral display consists of LED-matrix-arrays [Figure 1] placed around the human visual system. This means that peripheral area of human vision is covered by the LED-matrix arrays [Figure 2]. The random dots on those LED-matrix arrays move from far side to near side. Such visual stimulus to the peripheral vision can enhance user's sense of speed. As shown in Figure 3, the users of this system can watch outside view including display image in front of them through our system. Then users can feel more sense of speed by the effect of the peripheral display system.

Our application system, the sleighing simulator 2.0, consists of a sleigh like input device, a conventional display in front of the user, and the peripheral display. On the conventional display placed in front of the user, the forward vision of the sleighing simulator is provided. At the same time, users feel more sense of speed by the effect of the visual stimulus from the peripheral display. Then users control their sleigh through that sleigh like input device.

3. Acknowledgement

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References

Gerhard A. Brecher et al., 1972. Relation of optical and labyrinthian orientation, *OPTICA ACTA*, Vol. 19, No.5, pp.467-471.

Takuya, N., Yoshihiko, S., Yu, O., Yuki, H., and Hiroyuki, K., 2007, The Peripheral Display for Augmented Reality of Self-Motion, *proceedings of 17th International Conference on Artificial Reality and Telexistence*, 27-30, November.