“Vection Field” for Pedestrian Traffic Control

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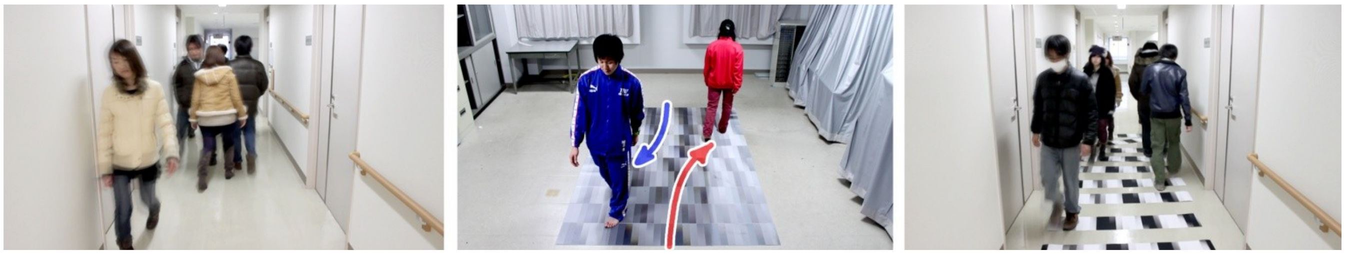

Figure 1 *(a)Congestions and collisions occur in a public pathway, (b)Proposed method: visual cues produced, (c)Proposed method keeps the pedestrians on the right of the pathway and prevents congestions and collisions.*

1. Introduction

Public pathways, in areas such as stations and concert halls, can present pedestrian crowds with difficulties, for example, congestions and collisions (Figure 1-a). Although visual signs and audio cues are commonly used for smoother pedestrian flow, they are often ignored or neglected because they require some time to be understood. For more intuitive navigation, wearable devices have been proposed, some of which induce motion using a haptic device [Kojima et al. 2009] or vestibular stimuli [Maeda et al. 2005]. However, these *personal* navigation devices are not suitable for congestion scenarios because *numerous* devices are required for controlling pedestrian flow, which is quite impractical. In this paper, we propose a novel method to control pedestrian flow using an environmental visual cue, which is produced by the placement of large lenticular lenses on the floor.

2. Method

We focused on large moving visual cues, which induce a sense of self-movement. For example, a large right-moving image on the floor induces a shift in walking direction to the right, even if the pedestrian tries to walk straight. This phenomenon occurs because of the dominance of vision on body balance [Lishman and Lee 1973].

Based on this observation, we placed a visual cue on the floor, which moved to the right relative to pedestrian. Consequently, the cue guided the pedestrians to the right (Figure 1-b).

3. Implementation

To implement our plan without a power source we used lenticular lenses. The lenticular lenses have a sheeted array of cylindrical lenses. Different images appear depending on the angle, achieving a type of animation. We prepared the lenticular lenses containing images of striped patterns. When the pedestrians moved forward, the stripes shifted to the right, inducing the pedestrians to the right side (Figure 2).

Note that the configuration is exactly the same for the two opposite-facing pedestrians. As shown in Figure 1-b, a woman in red walks on the lenticular lenses and watches the right-moving pattern. In contrast, the other pedestrian (the man in blue) observes the left-moving (for him, right-moving) pattern. Thus, his pathway bends to the left. As a result, the single sheet of lenticular lenses simultaneously works in two ways, avoiding the collision of pedestrians (Figure 1-c).

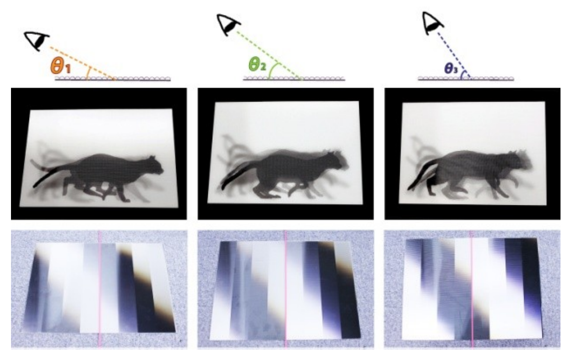

Figure 2 *The lenticular images change depending on the angle of the line of sight.*

The advantages of our method are summarized as follows. First, it achieves intuitive navigation that does not require a recognition process. Second, it does not require pedestrians to wear any devices. Third, our method does not require an electrical power supply. Fourth, a single sheet of lenticular lenses naturally works for both two opposite-facing pedestrians.

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