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Hen-Gen-Tou (Deformation Lamps)

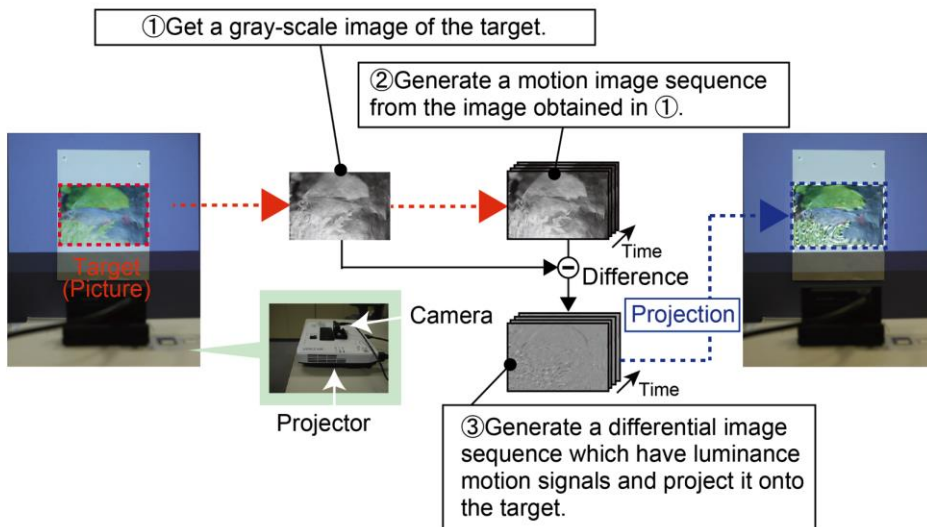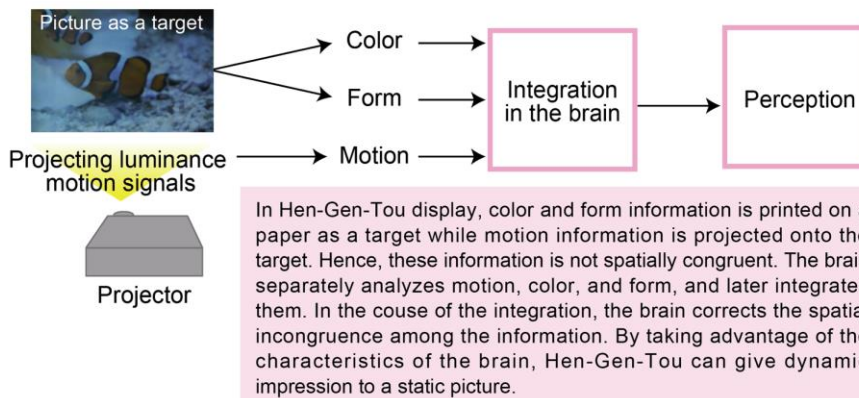## ～ Amazing illumination to make static objects dynamic ～

Abstract

"What is happening? Trees in a landscape oil painting are fluttering in the wind, and a man in a portrait suddenly starts speaking. This cannot be real." What if there were some way to produce such fantastic experiences. Though a promising method may be projection mapping, it cannot produce movements of static objects per se, since they "paint" a new color and texture on the object's surface without preserving the original surface's appearance. We have developed a novel type of projection mapping named 'HenGenTou' (Deformation Lamps), which can add a variety of dynamic impressions ranging from natural liquid flows to facial expressions to a printed image or other static materials. This capability is a result of our long-term scientific research on visual motion processing.

●Apparatus and image processing for Hen-Gen-Tou

①Get a gray-scale image of the target.

②Generate a motion image sequence from the image obtained in ①.

Target (Picture)

Camera

Projector

Time
Difference

Projection

Time

③Generate a differential image sequence which have luminance motion signals and project it onto the target.

●Visual mechanism supporting Hen-Gen-Tou

Picture as a target

Projecting luminance motion signals

Projector

Color

Form

Motion

Integration in the brain

Perception

In Hen-Gen-Tou display, color and form information is printed on a paper as a target while motion information is projected onto the target. Hence, these information is not spatially congruent. The brain separately analyzes motion, color, and form, and later integrates them. In the couse of the integration, the brain corrects the spatial incongruence among the information. By taking advantage of the characteristics of the brain, Hen-Gen-Tou can give dynamic impression to a static picture.

Related works

T Kawabe , et al., "A light projection method to perceptually deform two-dimensional static objects by motion information," ITE Annual Conference, 2014.

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