

Technology developed to control light scattering using holography

July 11 2013

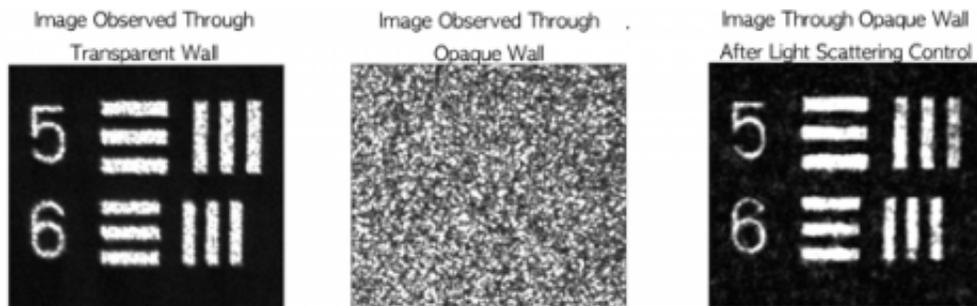


Figure 1. Observed images.

Recently, a popular article demonstrated that opaque glass becomes transparent as transparent tape is applied to the glass. The scientific principle is that light was less scattered as the rough surface of the opaque glass is filled by transparent tape. Professor Yong Keun Park from KAIST's Department of Physics, in a joint research with MIT Spectroscopy Lab, has developed the technology to easily control light scattering using holography. Their results are published on Nature's *Scientific Reports* May 29th online edition.

This technology allows us to view objects behind visual obstructions such as cloud or smoke, as well as visual objectives behind objects that highly scatters light such as [human skin](#). The research team applied the holography technology that records both the direction and [intensity of light](#) to control [light scattering](#) of the objects between the observer

and the visual objective. The team was able to retrieve the original image by recording the information of [scattered light](#) and reflecting the light precisely to the other side.

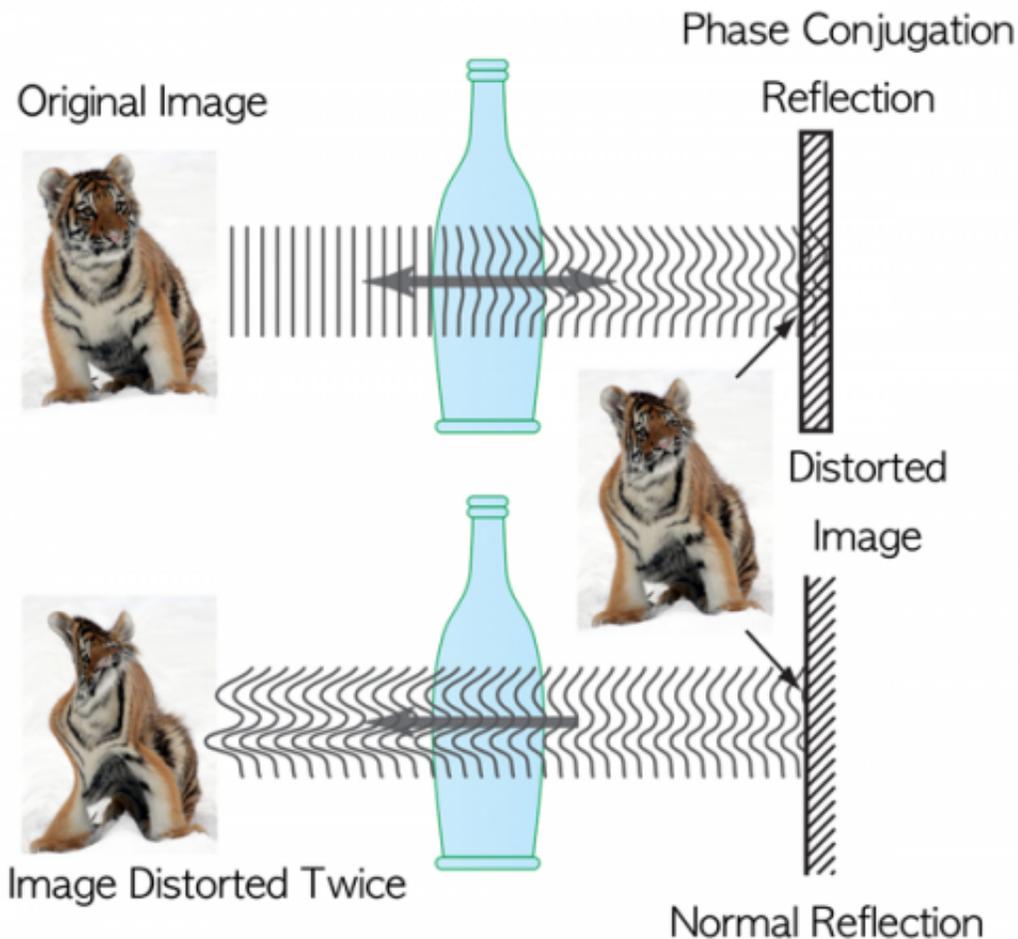


Figure 2. The principles of light scattering control.

This phenomenon is known as phase conjugation in physics. Professor Park's team was the first in the world to apply phase conjugation and digital holography to observe two-dimensional image behind a highly scattering wall. "This technology will be applied to in many fields of

physics, optics, nanotechnology, medical science, and even military science," said Professor Park. "This technology is different from what is commonly as penetrating camera or invisible clothes," he nevertheless drew the line at overinterpreting the technology, "Currently, the significance is on the development of the technology itself that allows us to accurately control the scattering of light."

Provided by The Korea Advanced Institute of Science and Technology (KAIST)

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