Abstracts

An Easy Method of Making Random-Dot Stereogram Using Microsoft Word

by
Masayuki YAMAZAKI
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Abstract
The random-dot stereogram (RDS) developed by Julesz for studies of human vision may be considered as a secret shearing scheme of cryptography. An easy method of making a pair of random-dot stereograms is demonstrated for a small scale information security system. One who is familiar with drawing pictures using a personal computer (PC) can make an RDS using the well-known software Word or Power Point developed by Microsoft and others who are not used to PC can make an RDS using papers on which the same random dots are printed, a scissor and a copy machine.

Keywords: random-dot stereogram, binocular vision, secret shearing scheme, security

Professor, Department of Applied Science, Course of Optics and Photonics

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Pictorial Analysis of Relationships between Spherical and Plane Waves

by
Masayuki YAMAZAKI
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Abstract
Spherical and plane waves have been described in many textbooks. In this paper, we show by illustrations that a spherical wave can be constructed by the envelopment/superposition of plane waves or inversely that a spherical wave can be decomposed into plane waves each having the same phase at certain point but a distinct propagation direction. A spherical wave is a spherical wave itself. At the same time, a spherical wave is equivalent to the superposition of many plane waves. Based on two interpretations of a spherical wave, we discuss Fraunhofer diffraction and the form of the wavefront of light emitted from an atom.

Keywords: plane wave, spherical wave, Huygen's principle, envelop, principles of superposition, probability

Professor, Department of Applied Science, Course of Optics and Photonics