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Proposal of representation of internal structure of objects using X-ray 3D-CT imaging and virtual reality (AR)

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X-ray imaging has been widely used in the fields of medical examinations, non-destructive testing, and security as observing the interior of objects due to its high penetrating power. Spectral CT can provide high contrast even for objects with similar densities, and can distinguish materials by using energy information. On the other hand, the amount of information about interior of objects obtained by multi-slice X-ray CT is much larger than that of visible light 3D images. For that reason, user of X-ray CT as medical professionals and examination technicians have to organize a large amount of information in their minds. For example, physician have to image in their mind the three-dimensional relationships and depth of the actual organs by viewing them on a fixed plane monitor. As a solution to this problem, this study proposes an application that displays data obtained from CT imaging in augmented reality (AR). An application was developed that displays the component of objects in 3D for non-destructive inspection of components. When a user points the object with a camera on the device such as smartphone and tablet, the device recognize objects as an AR marker and the internal image of the part was synthesized on the screen. User can understand the internal structure of the component from various directions by tilting and rotating the device. This study will contribute pseudo 3D color display technology using photon counting X-ray CT imaging.

Topics

Session C. Applied optics and engineering

Primary author: Mr KASE, Hiroki (Shizuoka University)

Co-authors: Mr NISHIZAWA, Junichi (Shizuoka University); Dr TAKAGI, Katsuyuki (Shizuoka University); AOKI, Toru (Shizuoka University)

Presenter: Mr KASE, Hiroki (Shizuoka University)

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