

## Visualization of X-ray beam using Augmented Reality(AR) technology

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Currently, X-rays are used in a variety of places by taking advantage of their penetrating effect, such as X-ray imaging and CT inspection in the medical field, and non-destructive testing field, and security field such as baggage inspections at airports. On the other hand, when taking image with X-rays, due to the fact that X-rays are invisible light, it takes much time on alignment, the operation status of the radiation source and detector is unclear, and the observer couldn't get the location where X-ray beam hits. These factors cause lack of efficiency when taking images with X-ray. So, visualization of X-ray beam is considered necessary.

As basic research, the visualization of the center line of X-ray beam as a pencil beam by using HoloLens2 in X-ray imaging environment is aimed.

This study proposed the following methods. A storage-type flat panel detector is used to measure X-ray's trajectory, and it is output to the real world as AR image with HoloLens 2. Using an X-ray source radiation is narrowed down by a collimator and a storage-type flat panel detector changing the distance between X-ray source and the detector, and detection is performed while accurately acquiring three-dimensional position information of the detector. Based on the data, X-ray trajectory was displayed in AR. As a result, it became possible to superimpose on X-ray imaging device in the real space, demonstrating the effectiveness of AR in X-ray imaging.

### Topics

Session C. Applied optics and engineering

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