TOYOHASHI
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特別講演会


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3D CMOS image sensor using pixel aperture technique

A 3D complementary metal oxide semiconductor (CMOS) image sensor using pixel aperture technique is presented in this talk. In conventional camera systems, the aperture is located between the object and the CMOS image sensor (CIS); this type of image sensor consists of a pixel array with red, green, and blue (RGB) Bayer pattern color filters. Our proposed image sensor uses red, green, blue, and white (RGBW) (without color filter) filters, and the aperture is located on the W pixel. A sharp image can be obtained from the W pixels, and the RGB pixels produce a defocused image with blurring. The sharp image can be compared with the defocused image to obtain depth information for 3D imaging. A metal layer, such as aluminum in the conventional CIS process, is used for the aperture on the white pixel. We designed and simulated a pixel model for the pixel aperture technique using a 0.11 μm CIS process and evaluated the performance of the proposed technique using finite-difference time-domain (FDTD) analysis. The proposed structures have been fabricated and some experimental results will also be presented.

講師紹介

Dr. Shin is Director,
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He received his BS in Electronics Engineering in 1978 from Seoul National University, Seoul, Korea; his MS in EE in 1980 from KAIST in Daejon, Korea and his Ph.D. in EE in 1991 from Colorado State University in USA. His research interests are CMOS image sensors (wide dynamic range, high sensitivity, 3D imaging); FET-type biosensors for detecting proteins and DNA sequence; and intelligent sensor systems.