Title:	Virtual Aperture Mask
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Keyword(s):	Aperture Coding Virtual Aperture Mask Ray Optics Pin Hole Camera
Subject(s):	Ray optics Computer Vision Geometric optics Image Processing
Abstract:	Coded aperture technique is used to target defocus blur problems. In coded aperture a patterned mask is placed just infront of the Aperture. Various researches have explored mask patterns and their properties but mostly in all the theories a patterned mask having aperture code pattern has to be physically inserted just infront of the aperture of the camera. To insert another pattern, camera has to be opened and reinsertion have to be done. Every time opening the camera and inserting the patterned mask is a manual process. Our research is to find a substitute for physical mask i.e., finding a virtual mask which can be easily changed as per the requirements without opening the camera. Also with our virtual mask we can even create masks with gray-scale value as compared to prevalent binary masks. To develop this virtual aperture mask we have explored Fourier optics, lens theory, illumination techniques and Geometric optics.

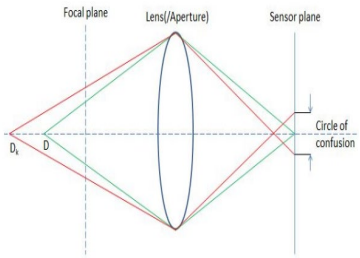


Figure 2.1: Ray diagram

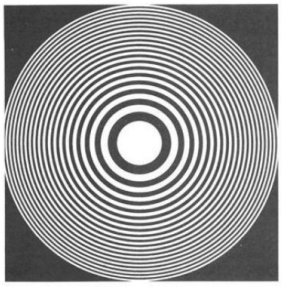
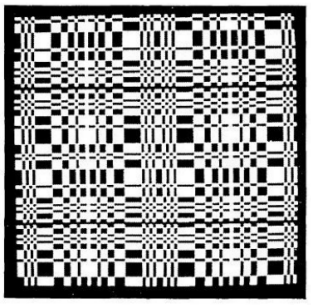


Figure 2.6: Fresnel Zone plate with 20 rings.



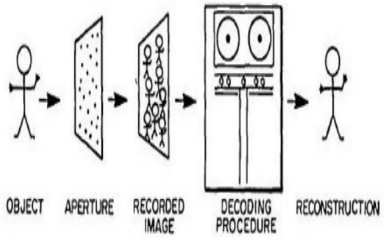


Figure 2.2: Principle of Aperture coding technique

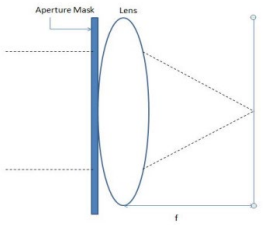


Figure 3.1: Position of Aperture with respect to lens.

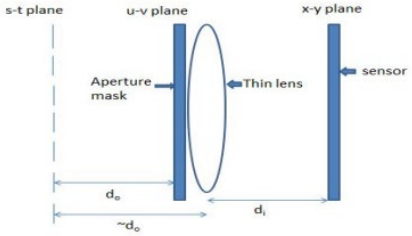


Figure 4.1: Planes arrangement