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(54) Title: EXTENDED DEPTH OF FIELD USING A MULTI-FOCAL LENGTH LENS WITH A CONTROLLED RANGE OF SPHERICAL ABERRATION AND CENTRALLY OBSCURED APERTURE

(57) Abstract: An extended depth of field is achieved by a computational imaging system that combines a multifocal imaging subsystem for producing a purposefully blurred intermediate image with a digital processing subsystem for producing a recovered image having an extended depth of field. The multifocal imaging system preferably exhibits spherical aberration as the dominant feature of the purposeful blur. A central obscuration of the multifocal imaging subsystem renders point-spread functions of object points more uniform over a range of object distances. An iterative digital deconvolution algorithm for converting the intermediate image into the recovered image contains a metric parameter that speeds convergence, avoids stagnations, and enhances image quality.



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