Abstract Submitted
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Interference Patter Structured Imaging Utilizing Micromirror Display DANIEL GRAY, Utah Valley University — IPSII is a lensless, single pixel imaging technique using mechanically scanned interference patterns. Using only simple, flat optics; no lenses, curved mirrors, or acousto-optics are used in pattern formation or detection. ISPII has no fundamental limit on working distance as well as a depth of field and field of view independent of resolution. An interference pattern is projected across the target object to obtain information using plane waves producing sinusoidal interference patterns allowing us to measure in the Fourier basis. Mechanically scanning the angles to change the interference pattern is slow, producing one pixel nearly every second. We intend to improve the time to scan an object by utilizing a micromirror array to modify the interference patterns such that multiple measurements can be made at one angle. Updating the micromirror array is much faster than changing the angles at which the target is scanned. This will greatly reduce the time required as we will not need to scan with as many angles to obtain an image as well as generating a wider range of basis functions. In addition to increasing the speed this may allow us to better utilize compressive sensing techniques where an n-pixel image may be obtained by scanning only a fraction of n-points on the object.

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