

Single-shot 3D reconstruction by Nyquist Sampling Profilometry
Zhenzhou wang

It is desirable for the 3D reconstruction technique to be single-shot, accurate, high-resolution, and low-cost. The line clustering (LC) based structured light (SL) technique could not satisfy the condition of high resolution. In this letter, we propose the Nyquist sampling profilometry (NSP) that has the potential to satisfy these four conditions simultaneously. We design the line pattern to meet the Nyquist sampling rate. Accordingly, the spectrum of the sampled phase pattern could be calculated by Fourier transform robustly and the spectrum of the full resolution phase map could be obtained by a low-pass filter robustly. The proposed approach is compared with $LCSL$ both qualitatively and quantitatively. Experimental results are favorable.