

3D Object Scanning System By Coded Structured Light

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Abstract

This paper proposes an approach to scanning a real 3D object by a digital camera and DLP projector and calculating its 3D coordinates by coded structured light. Because the coded pattern is composed of color groups which came from color stripes, we can decode the color groups by color stripes of scan line. Pattern coding by permutation can reduce the error rate when some color stripes lost in a single color group. The proposed method provides the error-resistant ability and reduces the overhead of computing. The resolution and performance of permutation coding proposed in this paper is better than that of other approaches in the same strategies. From the experiments, the reconstruction resolution is increased 46% which is superior to De Bruijn 3D scanning method by spatial neighborhood.

Keyword : Structured Light, 3D Scanning, Image Calibration, Color Correction, 3D Reconstruction.