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Time Efficient Color Coding for Structured-Light 3D Scanner

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Abstract : The structured light 3D scanner is commonly used for measuring the 3D shape of an object. Through projecting designed light patterns on the object, deformed patterns can be obtained and used for the geometric shape reconstruction. At present, Gray code is the most reliable and commonly used light pattern in the structured light 3D scanner. However, the trade-off between scanning efficiency and accuracy is a long-standing and challenging problem. The design of light patterns plays a significant role in the scanning efficiency and accuracy. Thereby, we proposed a novel encoding method integrating color information and Gray-code to improve the scanning efficiency. We will demonstrate that with the proposed method, the scanning time can be reduced to approximate half of the one needed by Gray-code without reduction of precision.

Keywords : gray-code, structured light scanner, 3D shape acquisition, 3D reconstruction
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