Multi-functional Imaging Systems using Concave Mirror

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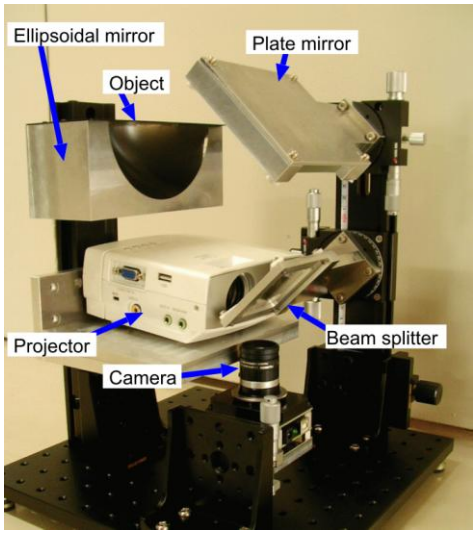
A variety of imaging systems which combine a camera and optics have been proposed for multi-functional imaging. In this talk, two imaging systems which combine a camera and concave mirrors are introduced. One is a combination of a camera with an ellipsoidal mirror. It enables us to measure reflection properties of object surface. The other is a combination of a camera with a polyhedral mirror. It enables us to realize extremely shallow depth of field. These new imaging systems are demonstrated.



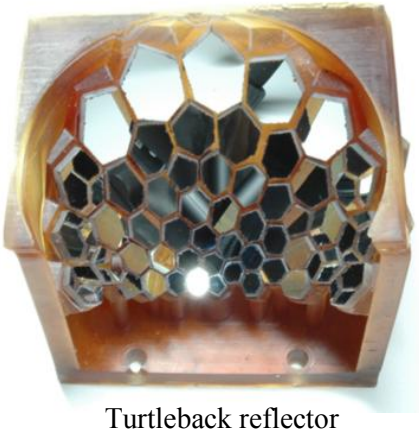
Total system

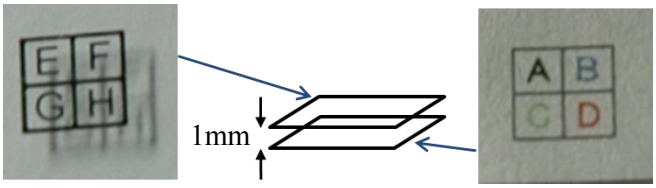

Ellipsoidal mirror


Real coin


CG using measured BRDF of the coin

Fig.1. BRDF measuring system using ellipsoidal reflector.


Turtleback reflector



Transparent sheet Printed paper


Different views with changing the DOF

Fig.2. Hemispherical aperture using Turtleback reflector.