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Modelling the appearance of heritage metallic surfaces

L. MacDonald¹, J. Hindmarch¹, S. Robson¹, and M. Terras²

¹Dept. of Civil, Environmental & Geomatic Engineering, UCL, London, UK

²Centre for Digital Humanities, Dept. of Information Studies, UCL, London, UK

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Abstract. Polished metallic surfaces exhibit a high degree of specularity, which makes them difficult to reproduce accurately. We have applied two different techniques for modelling a heritage object known as the Islamic handbag.

Photogrammetric multi-view stereo enabled a dense point cloud to be extracted from a set of photographs with calibration targets, and a geometrically accurate 3D model produced. A new method based on photometric stereo from a set of images taken in an illumination dome enabled surface normals to be generated for each face of the object and its appearance to be rendered, to a high degree of visual realism, when illuminated by one or more light sources from any angles. The specularity of the reflection from the metal surface was modelled by a modified Lorentzian function.

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