

# DEALING WITH NON-LAMBERTIANITY IN PHOTOMETRIC STEREO

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Photometric Stereo is a Computer Vision technique that reconstructs the three-dimensional shape of an object starting from a collection of images. These are collected under different lights conditions by a fixed camera. The model assumes that the light source is at infinite distance from the object and that the surface of the object is Lambertian. In real scenarios, the latter assumption is usually not satisfied. Indeed, no real surfaces are exactly Lambertian reflectors. In archaeological applications, that is our current main interest, we consider engravings on rocks that are not Lambertian. In these case, due to their composition, surfaces present some isolated points that reflect light in a non-Lambertian way. This results in a distortion in the

information that leads to inaccurate reconstructions. To deal with the presence of non-Lambertian reflectors, we propose an inversion method based on non-Euclidean norms. We exploit the sparsity inducing properties of these norms to detect and remove non-Lambertian patches. We apply this algorithm to syntethic and experimental datasets to study the performance of the proposed approach.