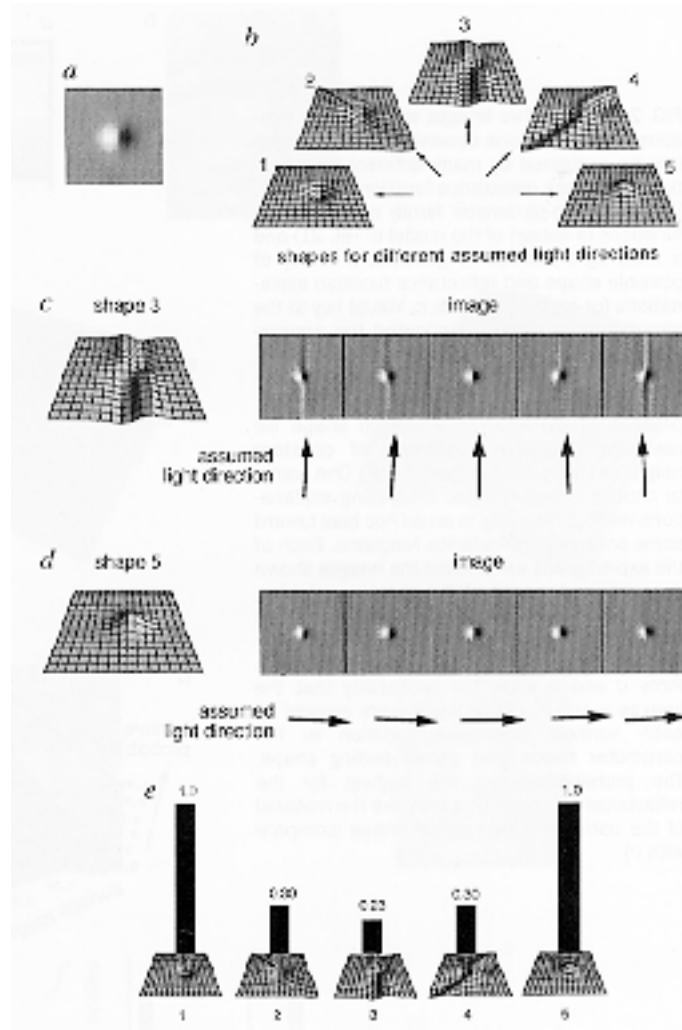# Exploiting the generic viewpoint assumption to estimate scene parameters

Blob example

(a) Perceptually, this image has two possible interpretations. It could be a bump, lit from the left, or a dimple, lit from the right. (b) Mathematically, there are many possibilities. The five shown here were found by a linear shape from shading algorithm assuming shallow incident light from different azimuthal directions. Shapes 2 -- 4 require coincidental alignment with the assumed light direction. For shape 3, (c), the rendered image changes quickly with assumed light angle; only a small range of light angles yields an image like (a). The generic view term of a "scene probability equation" penalizes an interpretation which has high image derivatives with respect to the generic variable, in this case light direction. For shape 5, (d), a much larger range of light angles gives the observed image. If all light directions are equally likely, shape 5 should be the preferred explanation. The probabilities of the candidate shapes, found using the scene probability equation, are shown in (e). The results favor shapes 1 and 5, in agreement with the perceptual appearance of (a).

References

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