

Classifying views of illuminated surfaces

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Abstract

Consider a surface in 3-space, which could be smooth or piecewise smooth, and could have a surface marking (fixed curve) lying on it. For example, the surface could be a 'creased surface' which is two smooth surfaces meeting in a smooth space curve along which the tangent planes to the two surfaces are distinct. This surface is illuminated (by parallel light), producing shaded regions and also cast shadow curves. The illuminated surface is then viewed from a direction different from the light source. What are the possible interactions between the features (creases, markings, shade and cast shadow) and the apparent contour of the surface? That is, what qualitatively different views are there, locally, of this illuminated surface? In this talk I shall describe joint work with James Damon and my postdoc Gareth Haslinger aimed at classifying these views. The work is part of the Insight2+ project funded by the European Union.