

Material from Motion

Shiny or Matte?

See: Hartung, B., & Kersten, D. (2002). Distinguishing shiny from matte [Abstract]. Journal of Vision, 2(7), 551a [abstract](#). DOI 10.1167/2.7.551.

This video shows how motion can affect material appearance.

The first half of the movie simulates a chrome teapot rotating in mid-air. The appearance is what one might expect, that of a shiny chrome teapot. Half way through the movie, the reflection gets painted on to the teapot making a "sticky reflection". The painted-on pattern mimics what one would see in the reflection of a perfectly reflecting chrome teapot. Now the body of the teapot appears more or less like a painted matte object during the second half of the movie. Try stopping the movie. The teapot reverts to a more shiny appearance.

Now with a croissant-shaped object:

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Many observers report that this polygonal object seems to look transparent rather than shiny-opaque.

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And the last one shows the "wrong" optic flow, in which the environment is moving about a different axis than the teapot.

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The highlights at points of high curvature in this last one conflict to some extent with the matte interpretation, and thus one can see these points as from a shiny object. Also, note the lack of contact information (inter-reflections are not modeled in this rendering) for the handle and spout.

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Movies were created by Bruce Hartung in collaboration with Dan Kersten and advice from Ted Adelson. The measured illumination map was obtained from <http://www.debevec.org/Probes/>.

This study was reported at the 2002 meeting of the Vision ScienceS Society in Sarasota, Florida:

Hartung, B., & Kersten, D. (2002). Distinguishing Shiny from Matte. Presented at Vision SciencieS, Sarasota, Florida.

For more on human perception of shiny objects, see:

Doerschner, K., Fleming, R. W., Yilmaz, O., Schrater, P. R., Hartung, B., & Kersten, D. (2011). Visual Motion and the Perception of Surface Material. *Current Biology*, 21(23), 2010–2016. <https://doi.org/10.1016/j.cub.2011.10.036>

R.W. Fleming, R.O. Dror, and E.H. Adelson. How do Humans Determine Reflectance Properties under Unknown Illumination? Proceedings of the Workshop on Identifying Objects Across Variations in Lighting at CVPR, Hawaii, December, 2001.