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R Basri, P Felzenszwalb, R Girshick, D Jacobs and C Klivans* (cjk@math.uchicago.edu),
1100 E. 58th St., Chicago, IL 60637. *Oriented Matroids and the Geometry of Visibility*.

Object recognition, the ability to recognize what objects are present in a given image, is a major goal of computer vision. One important challenge in visual object recognition involves modeling the variations in appearance that can occur as three-dimensional objects are viewed from different directions.

Given a limited number of images of an object taken from unknown viewpoints, we would like to determine which subsets of features might be simultaneously visible in other views. This leads to the problem of determining whether a set of images, each containing a set of features, is consistent with a single 3D object.

I will talk about how oriented matroids provide a natural model for the geometry of visibility. This perspective leads to complexity results and algorithms that perform well on both synthetic and real image data. (Received March 02, 2009)