1145-D1-2190 **Fumiko Futamura*** (futamurf@southwestern.edu), 1001 E. University Ave, Georgetown, TX 78626, and **Marc Frantz** and **Annalisa Crannell**. *Factoring homographies to analyze perspective distortions.*

Usually when we see a planar object in perspective or project its shadow onto the ground, its shape is distorted in some way. The image of a square may be a trapezoid, the shadow of a circle is often an ellipse. But under the right conditions, a small square tile of a tiled floor can actually look nearly square even when viewed in perspective, and the shadow of a circle can actually be a circle. These types of mappings from a plane to a plane are examples of *homographies*. In this talk, we present a factorization of a non-affine homography to derive a function that measures perspective distortion. We will use this function to find distortion-free points as well as infinite families of undistorted circle pairs, and connect these results to conformal points, stereographic projections and Apollonian circles. (Received September 25, 2018)