Perspective Projection
Problem Set 1

Computer Vision 2018
University of Bern

1 Image projections

1. Show that the perspective projection takes straight lines in 3D space and maps them to 2D straight lines on the image plane.
2. Show that perspective projection preserves incidence in 3D space also onto the image plane.
3. Show that the opposite is not true in general: That is, if two lines intercept in 2D space then they may not do so in 3D space.
4. Show that angles are not preserved in the perspective projection.
5. Show that lengths are not preserved in the perspective projection.
6. Determine the 3D plane that corresponds to the horizon.
7. Determine the projection of an opaque sphere onto the image plane.
8. What is the orthographic projection of an opaque sphere?