Shading Interpolation

Gouraud vs. Phong Interpolation

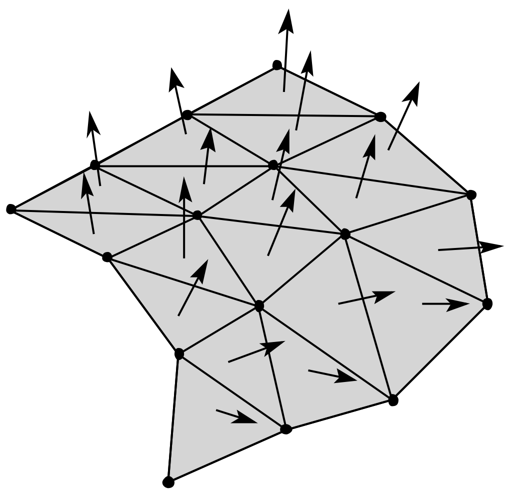
Smooth surfaces are often approximated by polygonal facets because:

- Graphic hardware generally wants polygons
- We know how to intersect rays with polygons

How do we compute the shading for such a surface?

Faceted shading

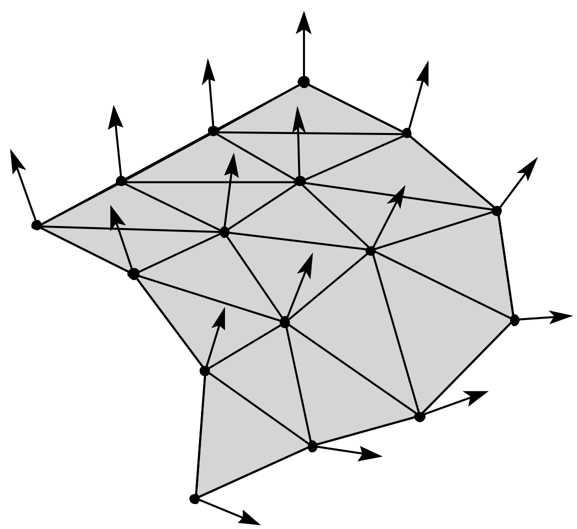
- Assume each face has constant normal

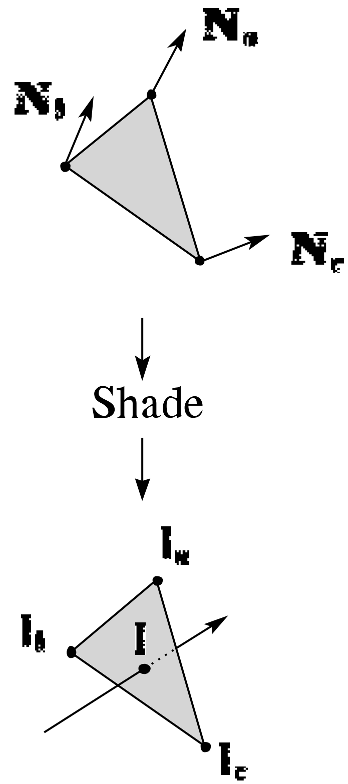


- Result: facted, non non-smooth, appearance

Gouraud interpolation

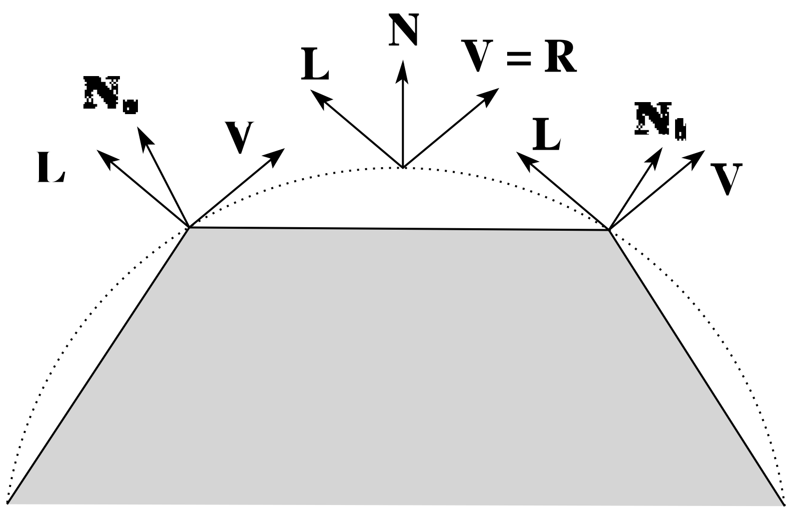
1. Compute normals at vertices
2. Shade only vertices
3. Interpolate the resulting vertex colors





Gouraud interpolation problems

1. If the polygonal approximation is too coarse we can miss specular highlights



2. We will encounter Mach banding

Phong interpolation

1. Compute normals at the vertices
2. Interpolate normals and normalize
3. Shade using the interpolated normals