

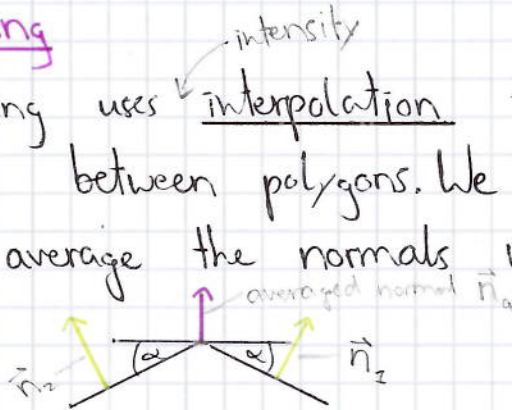
Shading Surfaces

Flat shading

- We compute colour C at one vertex ("corner") and use it for all pixels in the polygon.
- Each polygon is uniformly coloured according to its orientation.
- This makes us see the mesh, i.e. each individual polygon, the effect is made worse by the "mach band" effect, which says that the human eye (over-)emphasizes edges.

Gouraud shading

- Gouraud shading uses interpolation to smooth out the discontinuities between polygons. We interpolate colours.
- How? We average the normals where polygons share vertices



and thereby approximate the underlying surface.

Partial solution:

Edges can be tagged in data structure to avoid interpolation across them.

- Problems: Specular highlights may be distorted or completely "averaged away". Also, match banding may still be visible. Even edges may just be shaded away.

Phong interpolation

- Instead of interpolating colours, Phong suggested interpolating normal vectors.
- We interpolate the normal vector along the scanline.
- We compute the illumination model for every pixel.
- Advantage: Specular highlights are rendered correctly.
- Little drawback: Rendering is more expensive.