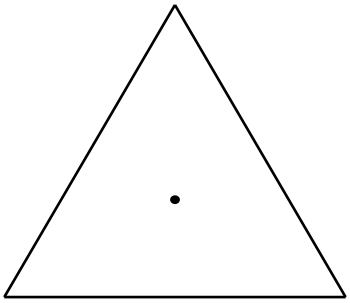
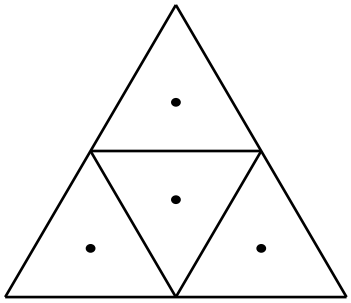
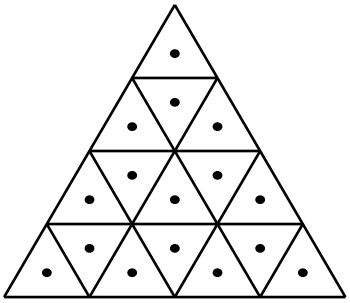
Ptex triangle textures



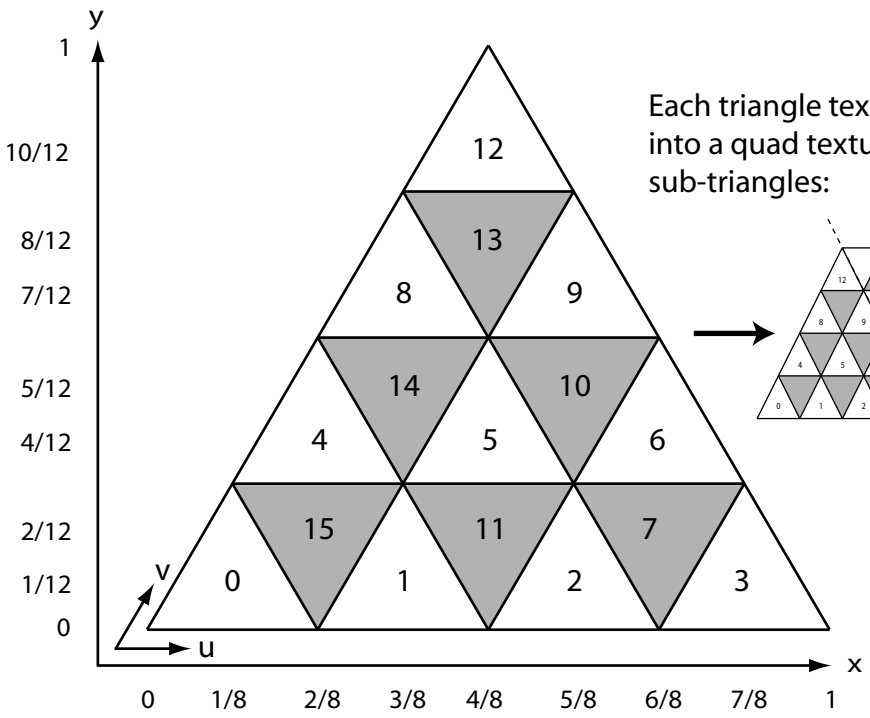
Level 0 = 1 texel



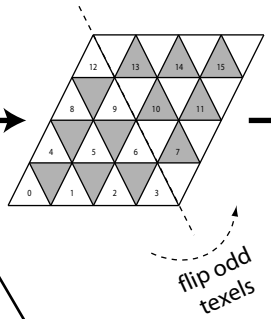
Level 1 = 4 texels

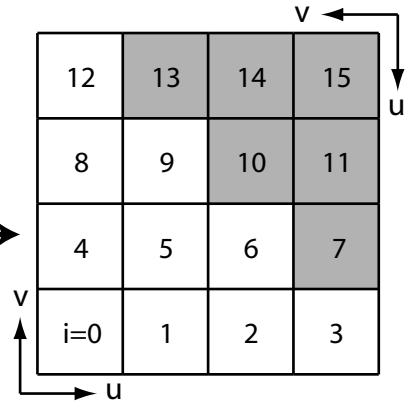


Level 2 = 16 texels
Level n = 4^n texels
(res = 2^n texels)



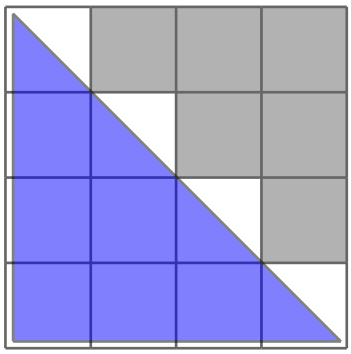
Each triangle texture is packed into a quad texture as two sub-triangles:





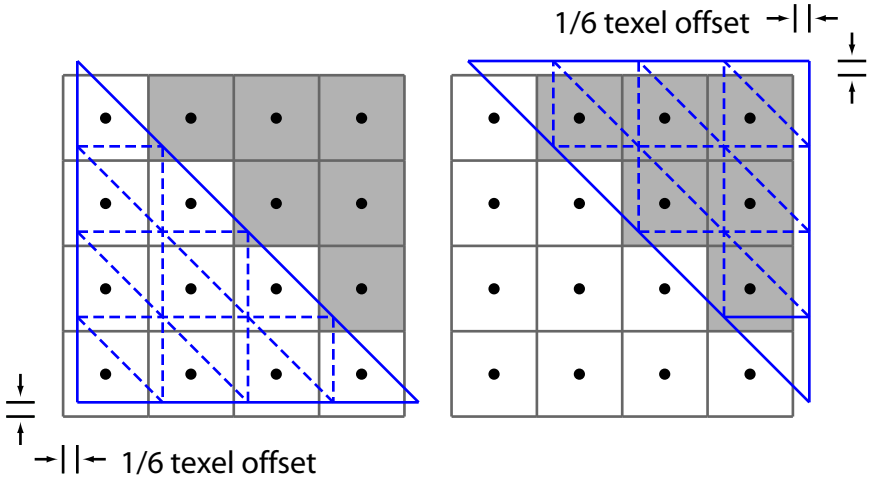
Indexing (computing i from u, v):
ut = u * res; vt = v * res;
ui = floor(ut); vi = floor(vt);
uf = ut-ui; vf = vt-vi;
if uf + vf <= 1: i = ui + vi * res
else: i = (res^2-1) - (vi + ui * res).

Rectilinear coordinate projection (for separable filtering):
x = u + v/2; y = v.



For GL display, the triangle can be rendered directly from the lower half-texture. A small epsilon should be used to keep the triangle inside the texture.

Alternately, a shader can point-sample the full texture using the above indexing method.



For paint projection (i.e. rasterizing triangles into the quad texture), two triangle projections are needed to cover the quad. A 1/6 texel offset is also required to align the triangle sample points with the quad texel centers.