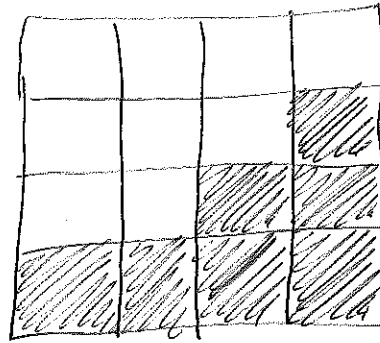
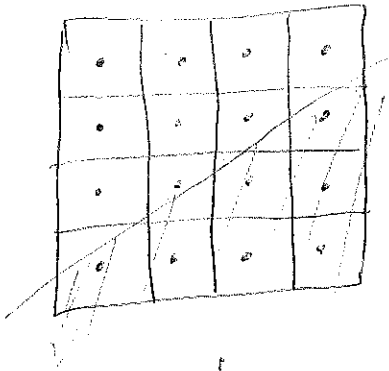
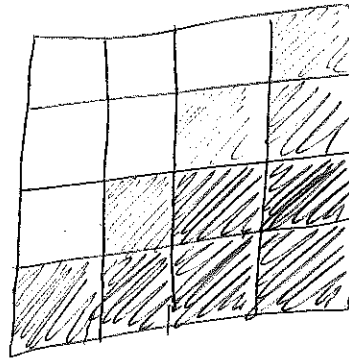
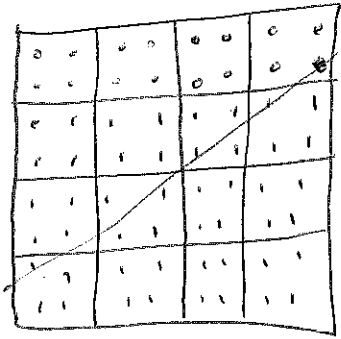


Anti-aliasing



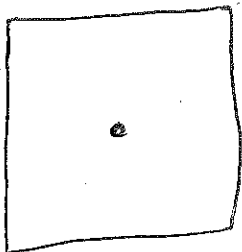
sharp jagged edges



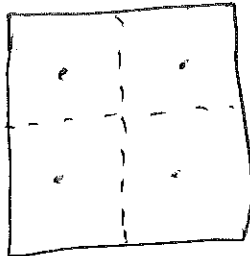
softer edges
more pleasant

Super-sampling

one pixel

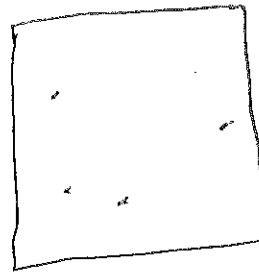


standard

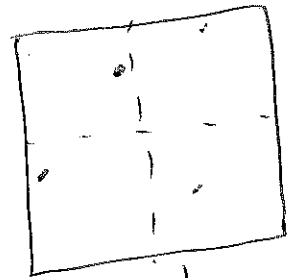


super sampling

multiple rays per pixel
regular - still makes patterns

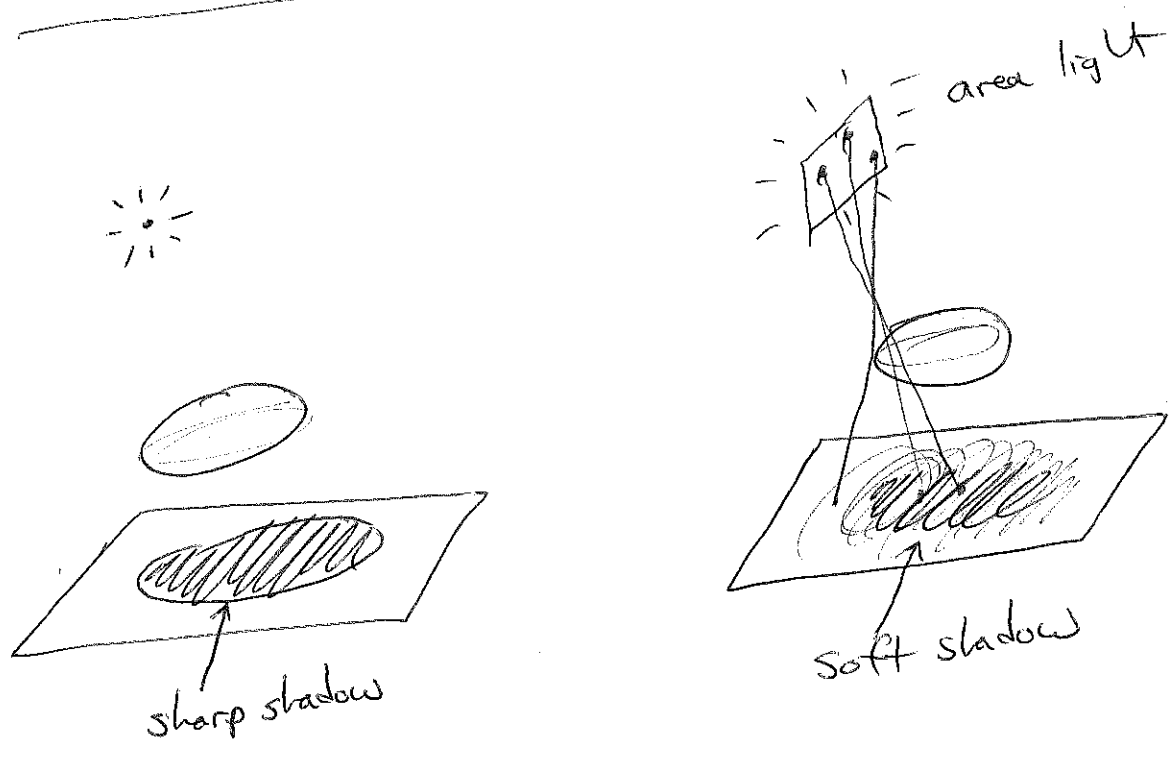


random, but not as even coverage

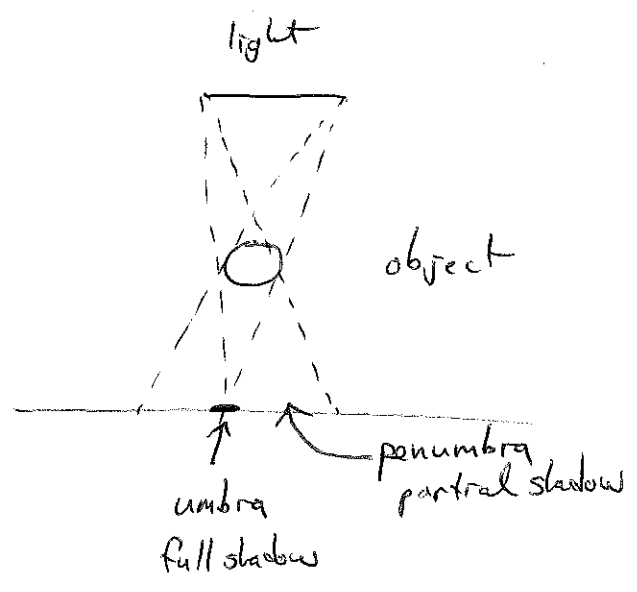


jittered
→ random in sub-pixel area (kind of good compromise)

Soft shadows / area lights

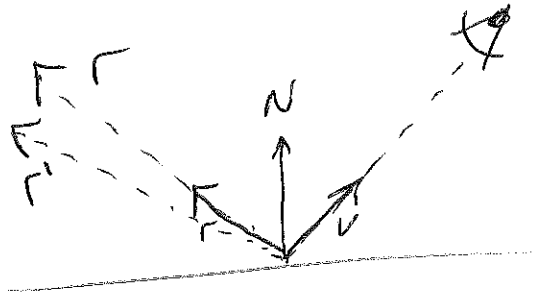


- * shoot ray to randomly chosen location in light
- * possibly shoot multiple rays to light



Fuzzy Reflections

randomly perturb
reflected direction



Acceleration Structures

triangle meshes \rightarrow ~~10~~ 1K \rightarrow 1M triangles

X 1024 x 1024 image

$$= 10^9 - 10^{12}$$

= lots of waiting

(x 16 super sampling

x reflection rays,

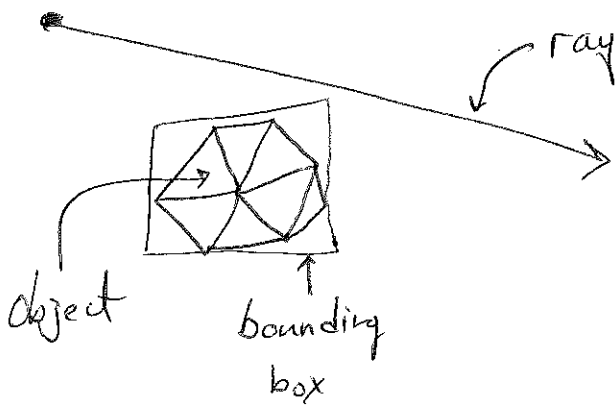
x 5 lights

x multiple light rays for area lights, etc)

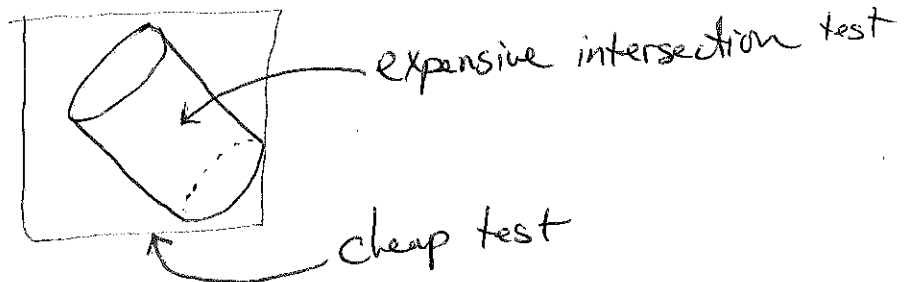
SLOW!

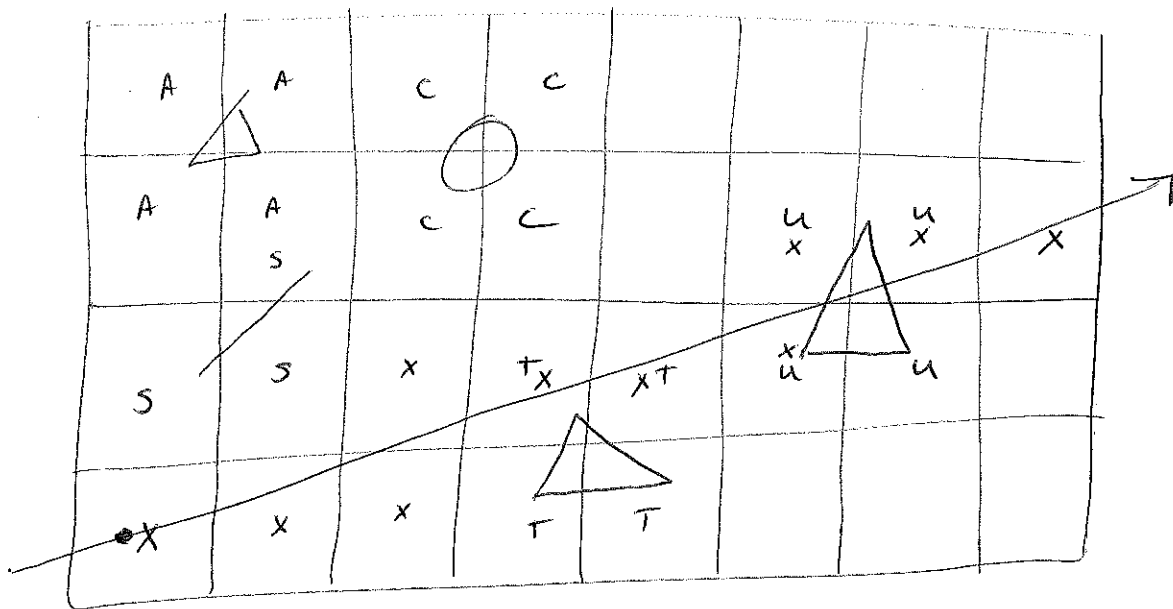
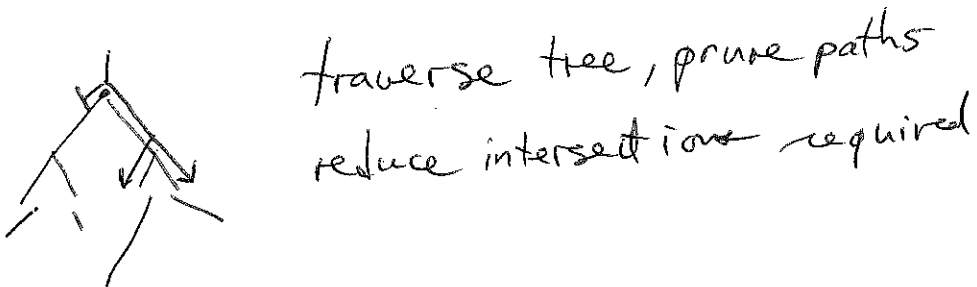
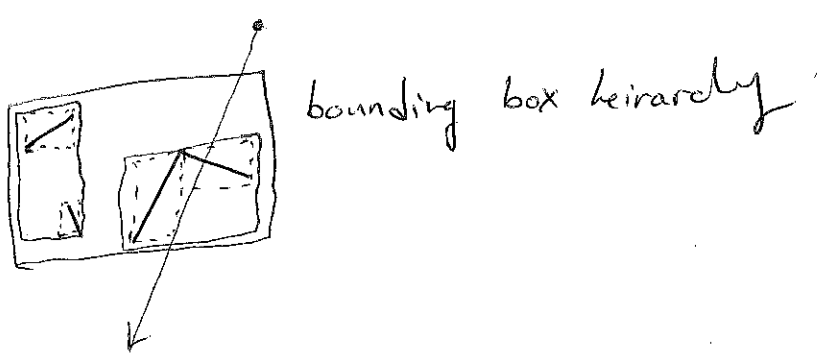
* must speed this up

\rightarrow acceleration structures



ray cannot possibly intersect object - no need to intersect with all those triangles





each cell stores list
of objects touching it

only test objects touching
x cells
→ line rasterization!

* ~~can~~ march through cells in order
ray hits them, ~~stop~~ stop when intersection
found.