visual perception, rods, cones
rod/cone sensitivity, reflectance, metamers
SPD vs perceived color
Mach bands
color planes in an image
rgb, hsv, cmy, yiq
gamut
extract brightness using YIQ matrix
salt and pepper noise, impulse noise, gaussian noise
convolve this kernel with this image - resulting pixels? resulting image?
mean blur, gaussian blur, gradient, scale
mean vs median filter, normalize filter weights
dge detection
threshold
transformations: 2D, 3D
order of transformations - global coord system, local changing coord system
scale, reflect, shear, rotation matrices and their effects
homogeneous coords
given opengl method calls show the associated transformation matrices
dot product - draw it, calculate it, use it
cross product - draw it, calculate it, use it
model hierarchies - instances at nodes, transformations along edges
world space to eye space is a translation and a rotation, give the matrix to do it
parallel projection, perspective projection, vanishing points
hidden surfaces, z-buf, ray casting
Phong illumination model, Gouraud vs Phong interpolation
ray tracing, generate the rays, use them to calculate shading
refraction, Snell’s law
intersection ray-plane, ray-sphere, ray-something
super-sample, average down, adaptive sampling
distribution ray tracing, effects from distributing rays in space and time
texture mapping
u,v mapping
bilinear interpolation, interpolation using barycentric coords
pre-filtered texturing - mip mapping, summed area tables
displacement mapping, bump mapping
evironment mapping
parametric curves
given Bezier control points, draw Q(u), Q(k), convex hull
connect Beziers with C^0, C^1, C^2 continuity
construct Bezier control points using Catmull-Rom technique
construct Bezier control points using deBoor points (B-spline)
construct Bezier, B-spline surface
particle systems - basic pseudo code operation
forces
animation principles