

Noise !

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CS 519

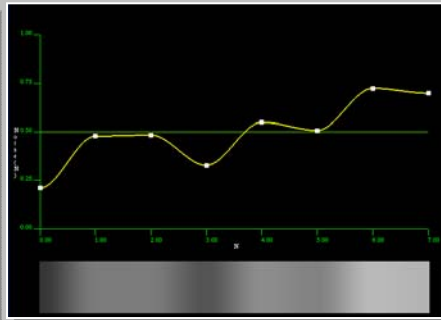
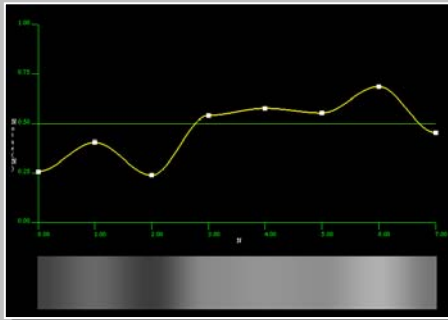
Oregon State University



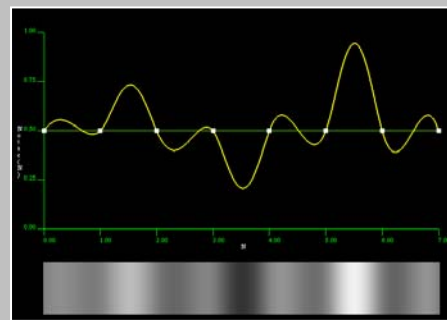
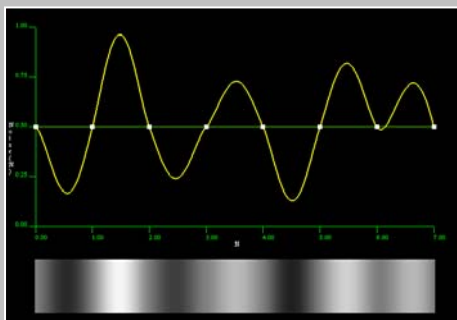
Noise:

- Can be 1D, 2D, or 3D
- Is a function of input value(s)
- Ranges from 0. – 1.
- Is equal to 0.5 at integer input values
- Looks random, but really isn't
- Has continuity
- Is repeatable

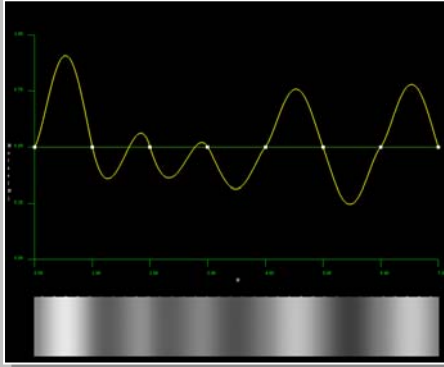
Positional Noise



Gradient Noise

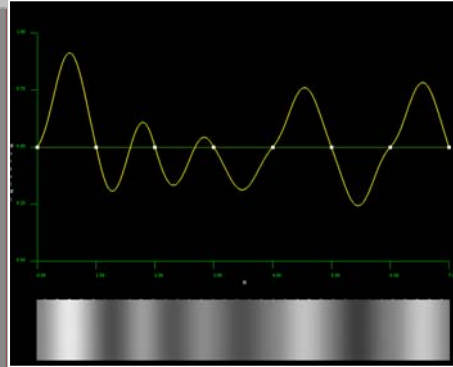


Quintic Interpolation Creates More Continuity Than Cubic



Cubic: C^1

$$N(t) = 3t^2 - 2t^3$$

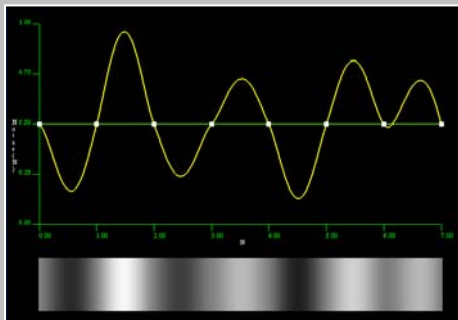


Quintic: C^2

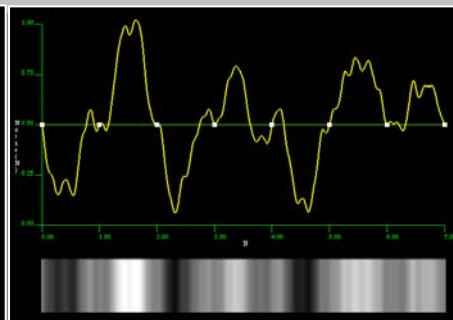
$$N(t) = 10t^3 - 15t^4 + 6t^5$$

Noise Octaves

Idea: Add multiple noise waves, each one twice the frequency and half the amplitude of the previous one



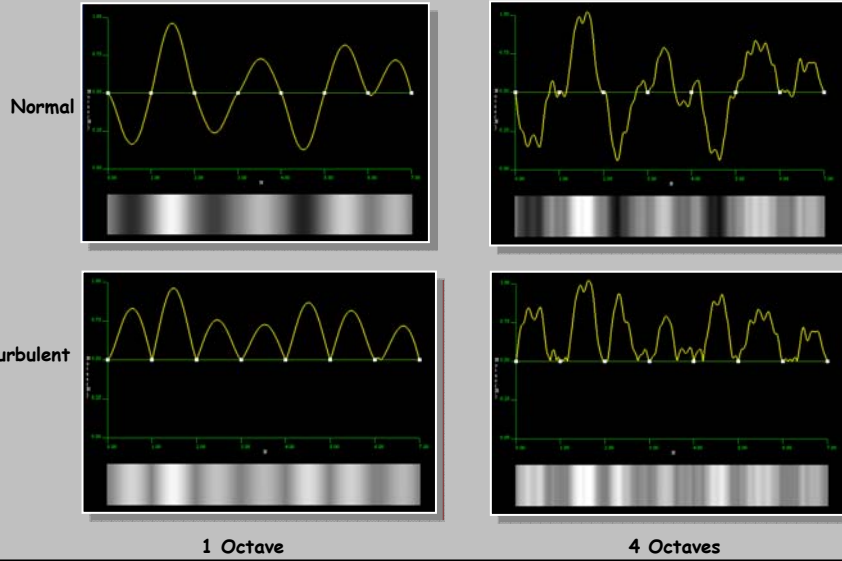
1 Octave



4 Octaves

Turbulence

Idea: Take the absolute value of the noise about the centerline, giving the noise a "sharper" appearance



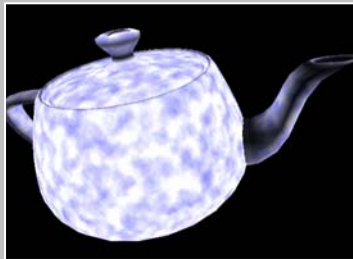
Examples



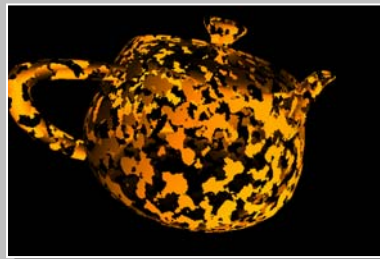
Color Blending
for Clouds



Color Blending
for Fire



Color Blending
for Marble



Deciding when to
Discard for Erosion