Coverage, compositing and the alpha channel

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Textbook Chapter 16

Several slides courtesy of M. Kim

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Today

- Announcements
  - Q3 preparation: can skip Ch 17. See L27 for topics, and list of chapters
  - A4 clarifications and tips.
    - Include a Viewport transform from NDC to texture cords
    - Do the perspective divide yourself, in fragment shader
- A3 spotlights
- Q3 practice problem discussion
- Coverage and alpha
- Multisample anti-aliasing
- Compositing

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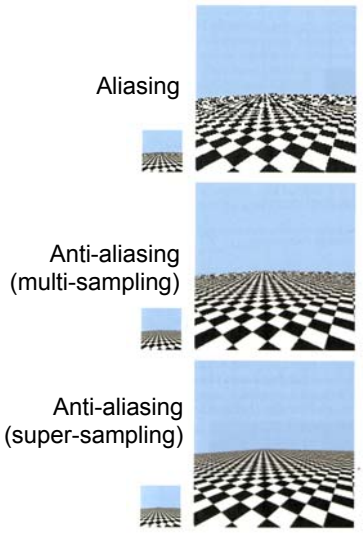
Recap: Aliasing and anti-aliasing



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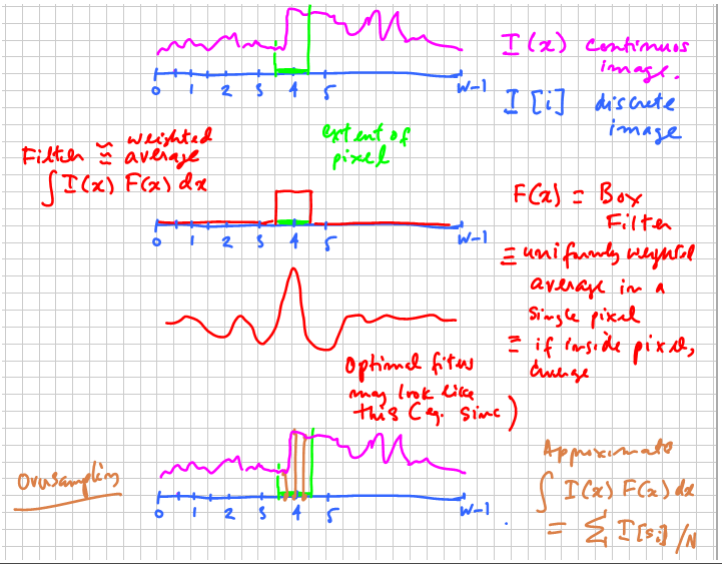
Recap: Sampling in 1D



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Coverage

- Rapid changes in color could be due to
  - Texture
  - Shading
  - Depth discontinuities
- Supersampling deals with all at one, but at great cost
- It may be more efficient to separately handle each of the source of color change

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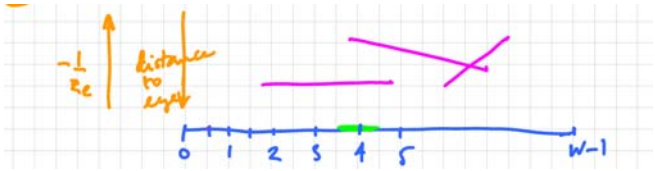
Coverage

- Texture => Pre-filtered textures, “mip mapping”
- Shading => generally changes slowly, except at edges of triangles
- Depth discontinuities => check if discontinuity passes though pixel



- Estimate partial coverage of pixel by triangle fragment
- Fraction of pixel covered is denoted alpha (α).

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Multi-sampling

- *During the rasterization* of each triangle, "coverage" and z-values are computed at "high resolution".
- But for efficiency, the fragment shader is only called **only once per final resolution pixel.**
  - This color data is shared between all of the samples hit by the triangle in a single (final resolution) pixel.
- Once rasterization is complete, groups of these high resolution samples are averaged together.

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Multi-sampling

- Multisampling can be an effective anti-aliasing method since, without texture mapping, colors tend to vary quite slowly over each triangle, and thus they do not need to be computed at high spatial resolution.
- To deal with aliasing that occurs during texture mapping, we have the advantage of possessing the texture image in hand at the outset of the rendering process.
- This leads to specialized techniques such as *mip mapping*.

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Compositing?

- Example of demo reel
  http://vimeo.com/72617082

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