




Using the Accumulation Buffer for Visualization



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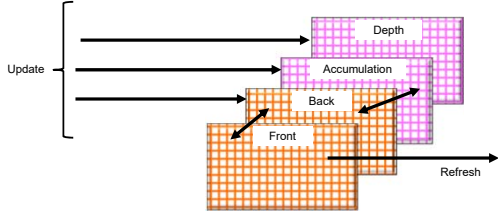


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accumbuffer.pptx
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The Framebuffers



Here's how the Accumulation Buffer works:

1. You can multiply the RGBs in the Back Buffer by a constant
2. You can multiply the RGBs in the Accumulation Buffer by a constant
3. You can add the RGBs in the Back Buffer to the RGBs in the Accumulation Buffer
4. You can copy the Accumulation Buffer to the Back Buffer



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Using the Accumulation Buffer to Achieve *Motion Blur*


1. Draw the new frame into the Back Buffer and multiply all its RGBs by A.
2. Multiple all the Accumulation Buffer's RGBs by (1. - A) and add the Back Buffer into it ("GL_ACCUM"). Basically, you are blending the new animation frame with a collection of old frames.
3. Copy ("GL_RETURN") the Accumulation Buffer to the Back Buffer.
4. Swap the Front and Back Buffers ("glutSwapBuffers").

The framebuffer starts out as: $FB_0 = \text{Black}$

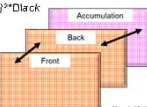
The first frame results in: $FB_1 = A * F_1 + (1-A) * FB_0 = A * F_1 + (1-A) * \text{Black}$

The second frame results in: $FB_2 = A * F_2 + (1-A) * FB_1 = A * F_2 + (1-A) * A * F_1 + (1-A)^2 * \text{Black}$

The third frame results in: $FB_3 = A * F_3 + (1-A) * A * F_2 + (1-A)^2 * A * F_1 + (1-A)^3 * \text{Black}$

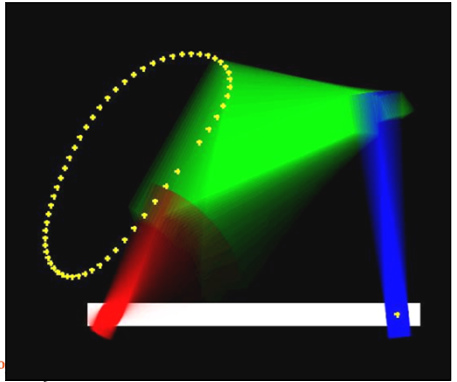



```
glAccum( GL_MULT,    A );
glAccum( GL_ACCUM,  1.-A );
glAccum( GL_RETURN, 1.00 );
```



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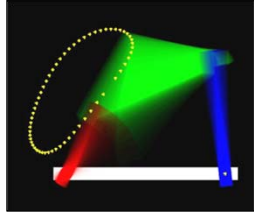
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Using the Accumulation Buffer to Achieve *Motion Blur*




The framebuffer starts out as: $FB_0 = \text{Black}$

The first frame results in: $FB_1 = .900 * F_1 + .100 * FB_0 = .900 * F_1 + .100 * \text{Black}$

The second frame results in: $FB_2 = .900 * F_2 + .100 * FB_1 = .900 * F_2 + .090 * F_1 + .010 * \text{Black}$

The third frame results in: $FB_3 = 0.900 * F_3 + .090 * F_2 + 0.009 * F_1 + 0.001 * \text{Black}$



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