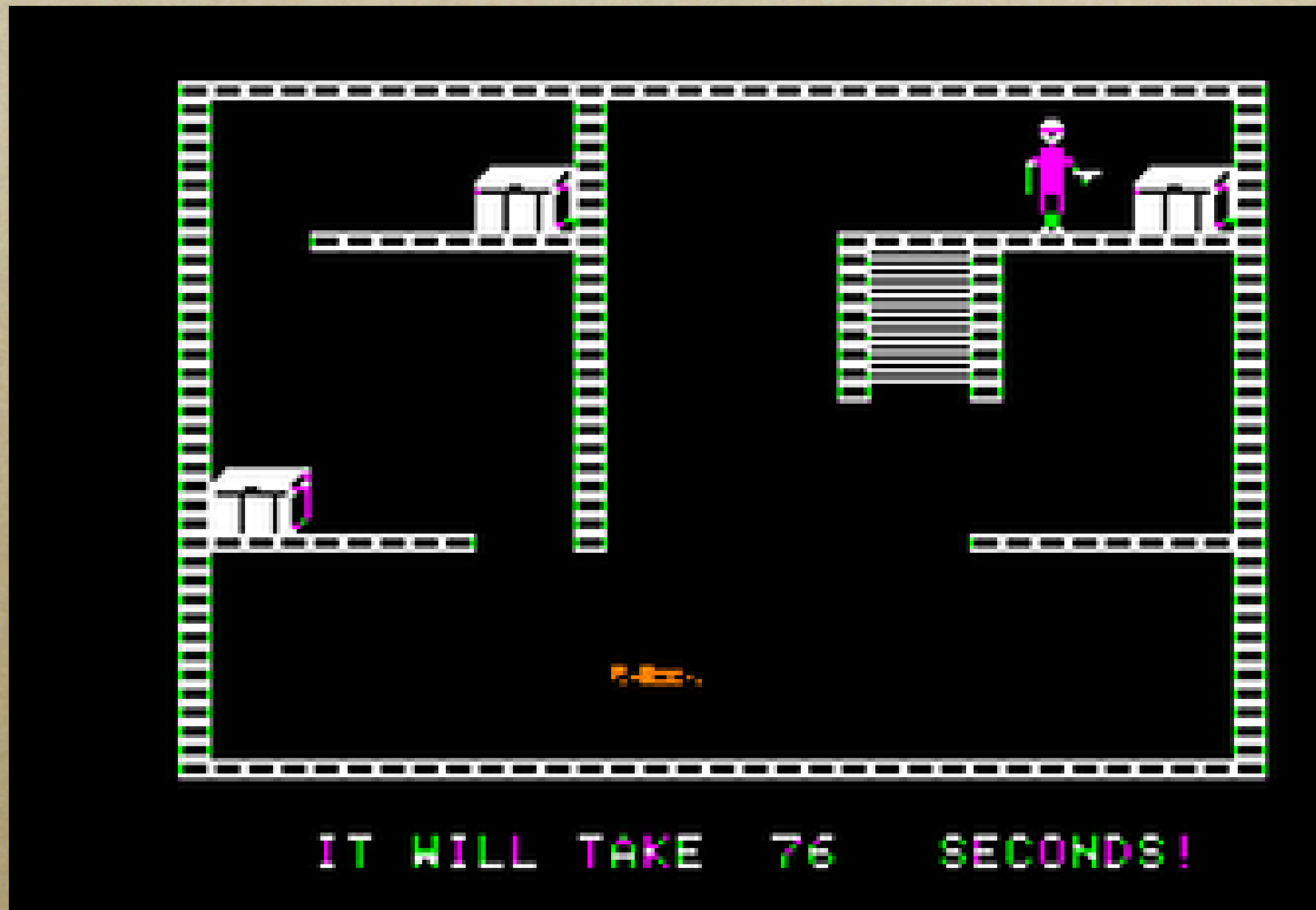


Level of Detail, Games ...

- *Games + Graphics → Money*
- *Games are mostly repeats (yawn)*
- *But glitter sells*
- *How do we get glamorous pictures in real time?*

Examples:









100

0

8

Moby Games

CRIMES OF WAR

The background of the menu is a dark, rainy street in a war-torn city. A green tank is parked in the middle of the street, facing right. The buildings on either side are heavily damaged, with many windows missing and walls crumbling. The rain is falling heavily, creating a somber and gritty atmosphere.

NEW GAME

LOAD GAME

MULTIPLAYER

OPTIONS

CREDITS

EXIT

The Chase

When the ZE8 compound was destroyed and the head of the UberMacht - Ernst Scheffer - killed, the war reached its turning point. Allied troops launched an open attack on all fronts and the successful outcome of the war seemed close at hand.

The Opposition headed by Anton Drecksler continues its struggle against the UberMacht forces by launching assaults on secret units and destroying the leaders of the organization. One day, during an operation, the Opposition finds out about the location of a facility which produces T9 - a medication that suppresses the will of resurrected soldiers.

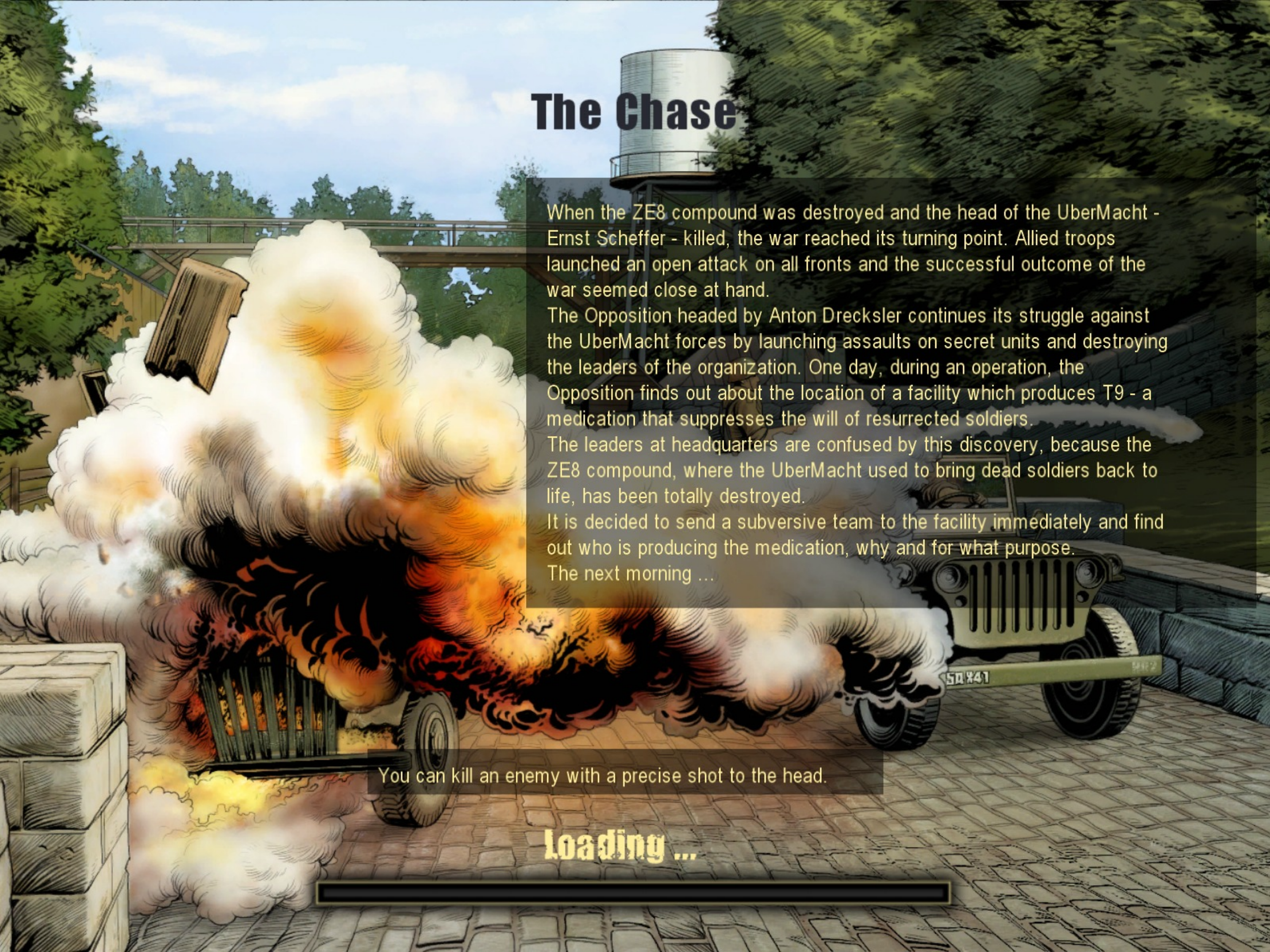
The leaders at headquarters are confused by this discovery, because the ZE8 compound, where the UberMacht used to bring dead soldiers back to life, has been totally destroyed.

It is decided to send a subversive team to the facility immediately and find out who is producing the medication, why and for what purpose.

The next morning ...

You can kill an enemy with a precise shot to the head.

Loading ...





Karl, the other path outside probably leads through technical facilities. I'll deal with the lock, you take care of the guards on the towers.





RACEDRIVER

GRID

PLEASE PRESS ENTER

LAP 1/3

Points

0



LAP 1/3

TIME 00:00:00
LAP 00:00:00

12/12

Scott Jenson 1

Taylor Richards 10

Oscar Soper 11

Player One 12

rs

ebay

Motors

tors

88888

200

CHAMPION

CHAMPION

CHAMPION

CHAMPION

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CHAMPION





The Lord of the Rings: Conquest

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The Witcher: Enhanced Edition

◀ prev image

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The Witcher: Enhanced Edition

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OK, so how is it done?

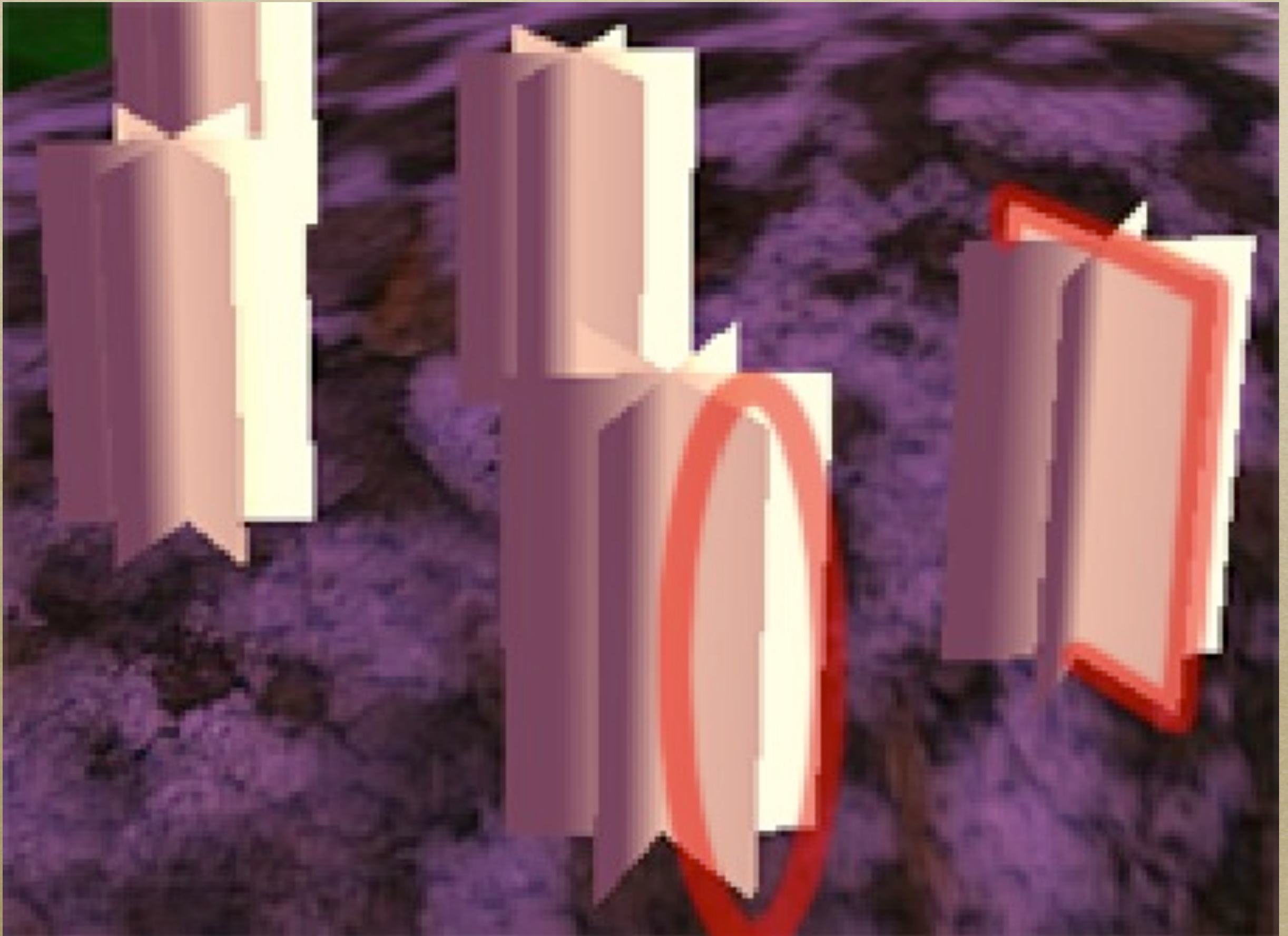
- *Partly driven by fast hardware*
- *Textures and billboards*
- *Level of Detail*
- *Pre-rendered background*
- *Limited viewing possibilities*

Textures and Billboards

- *Wolfenstein 3D introduced cheap scalable wall textures.*
- *Only viewed ‘vertically’*
- *Painted on walls all at right angles*
- *Simply scaled with distance.*
- *2.5D visible surface calculation.*

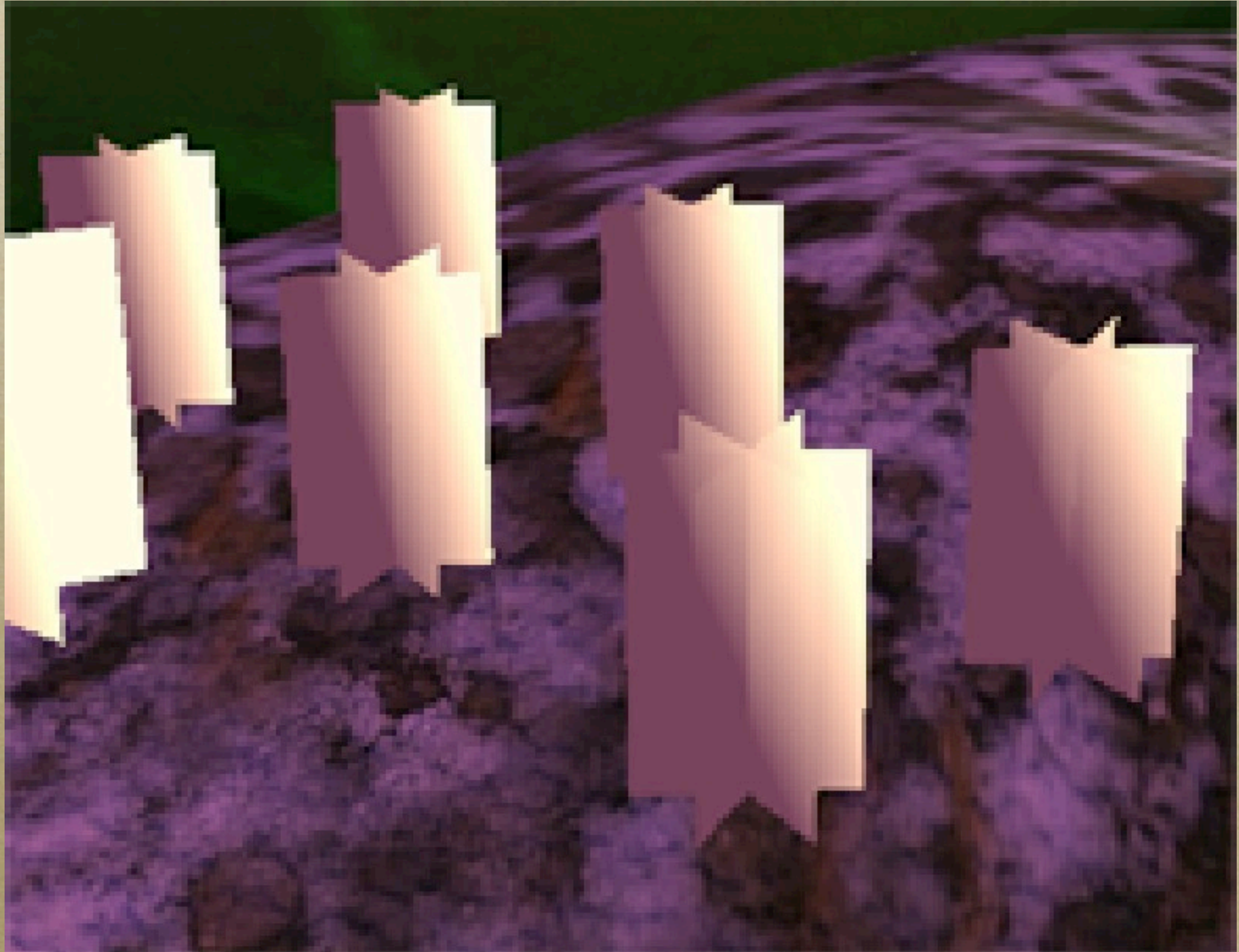
Billboards

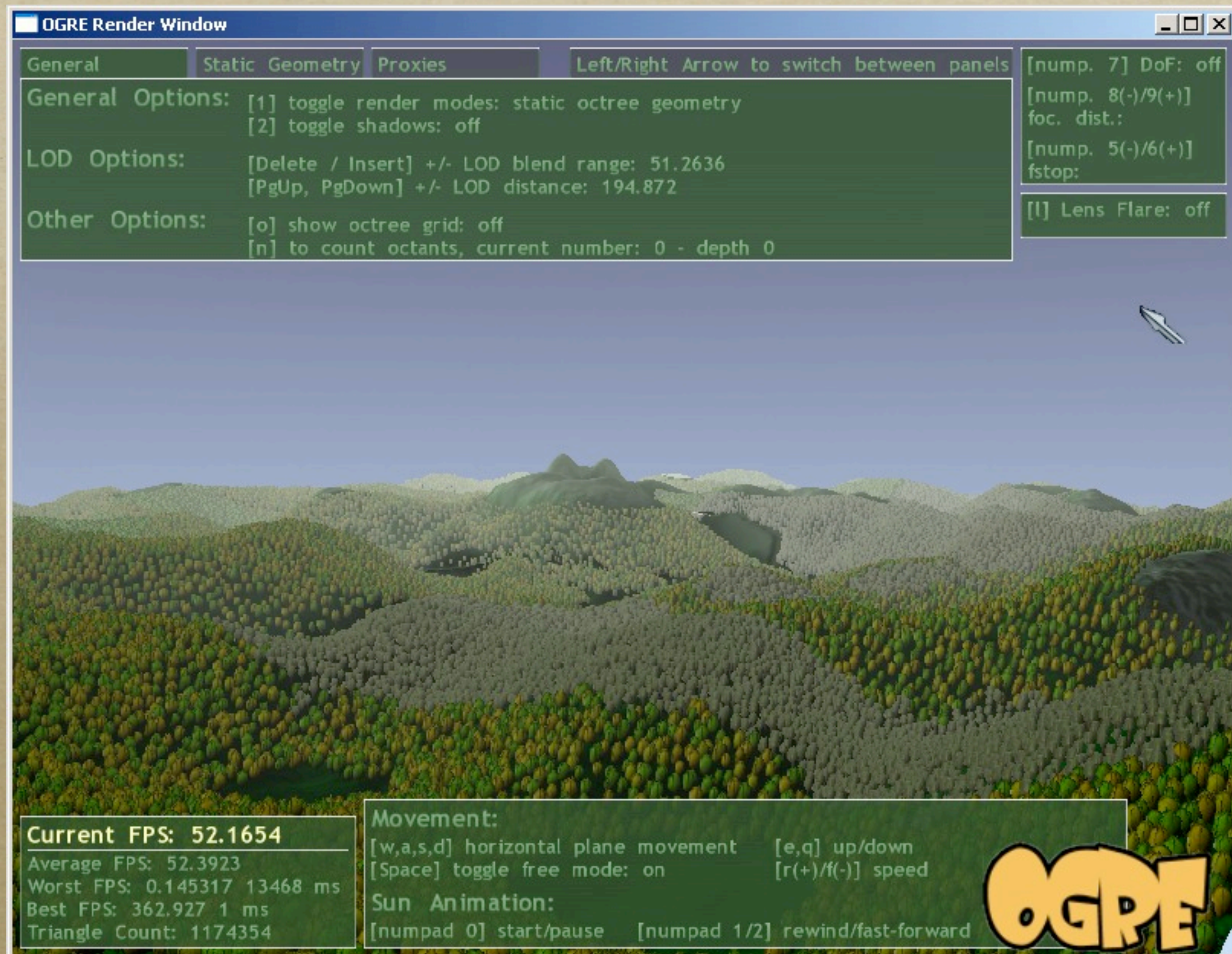
- *Paint texture onto a single triangle or quad.*
- *Include transparency - easy with alpha channel*
- *Swap textures for different viewing angles*

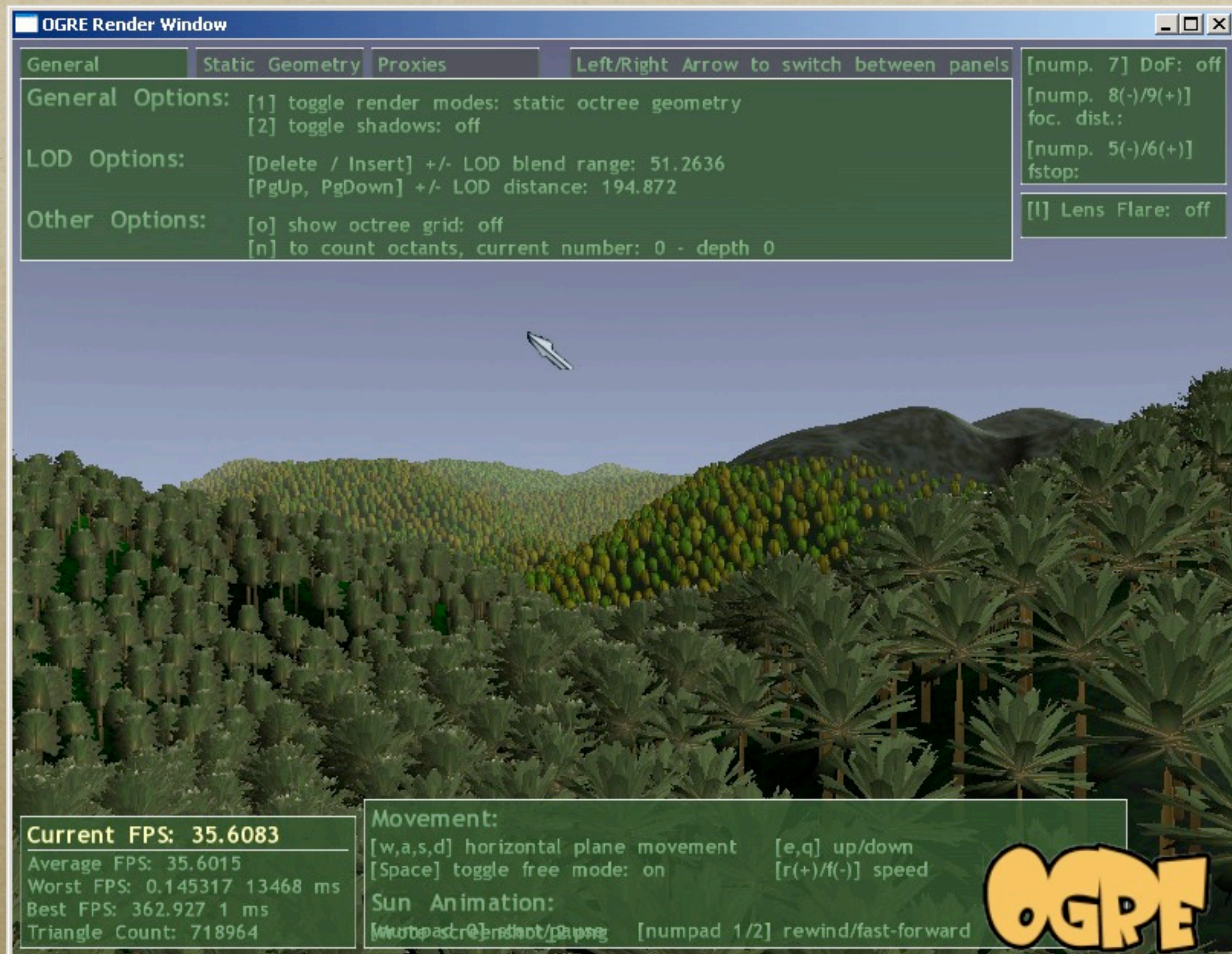








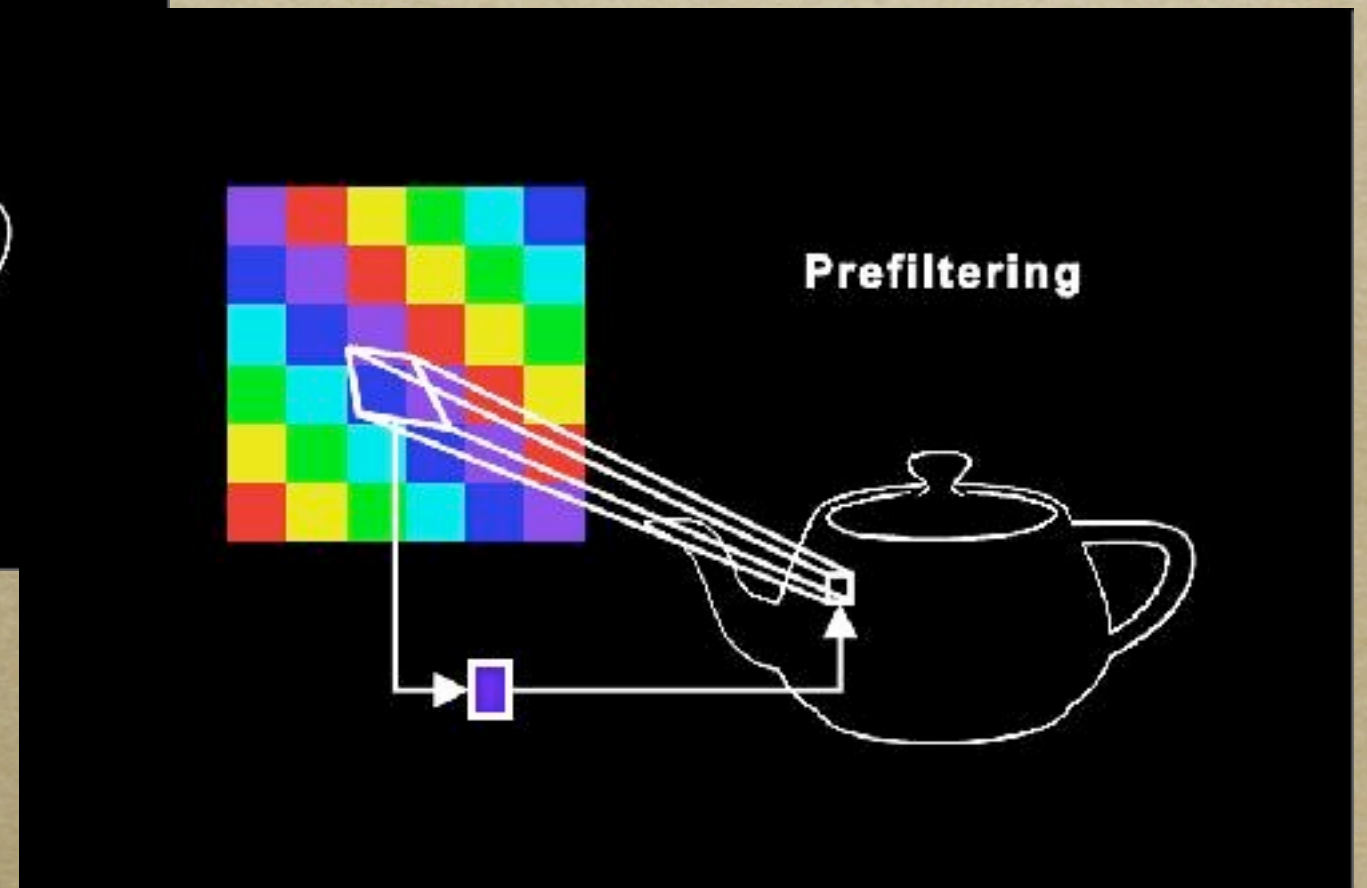
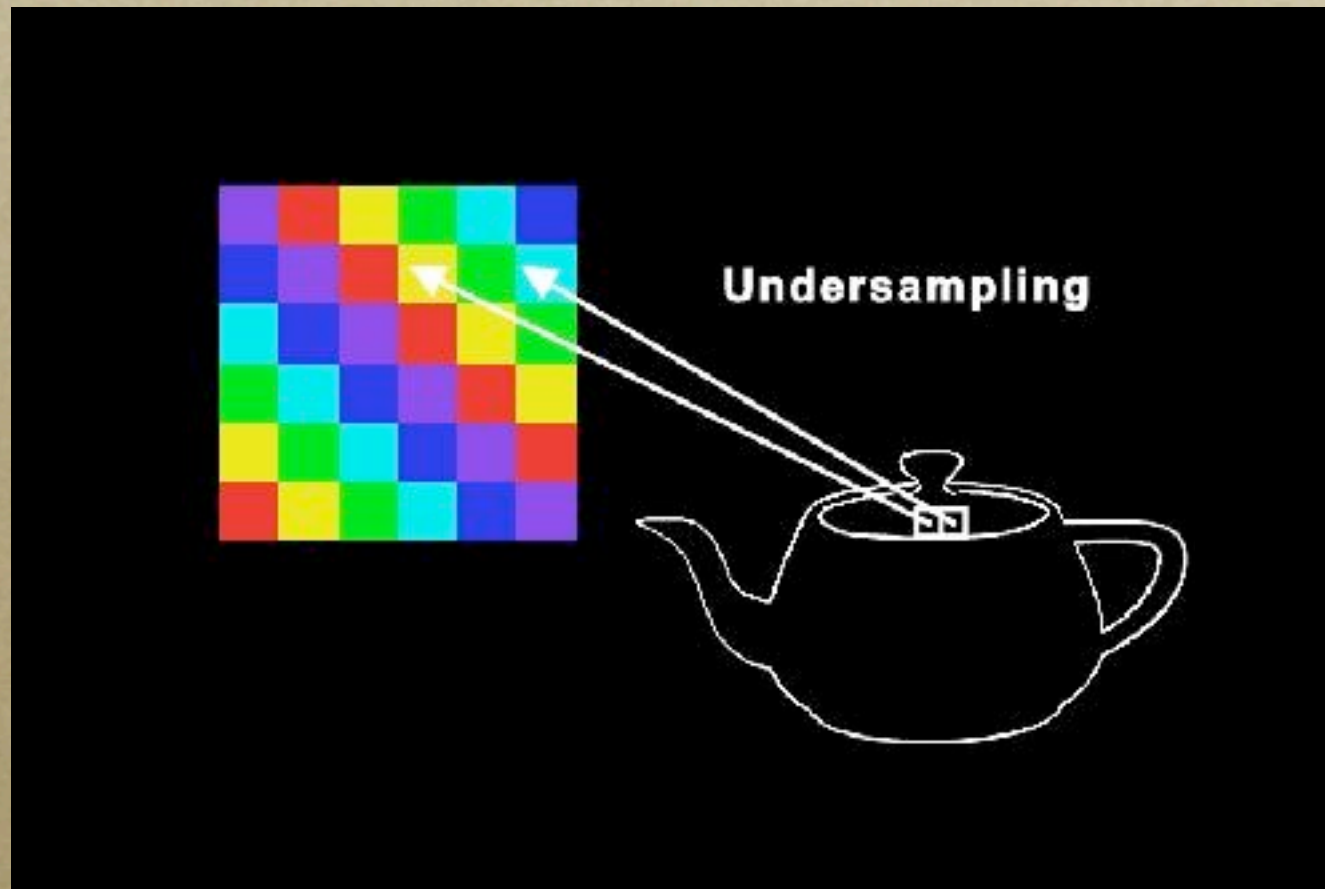




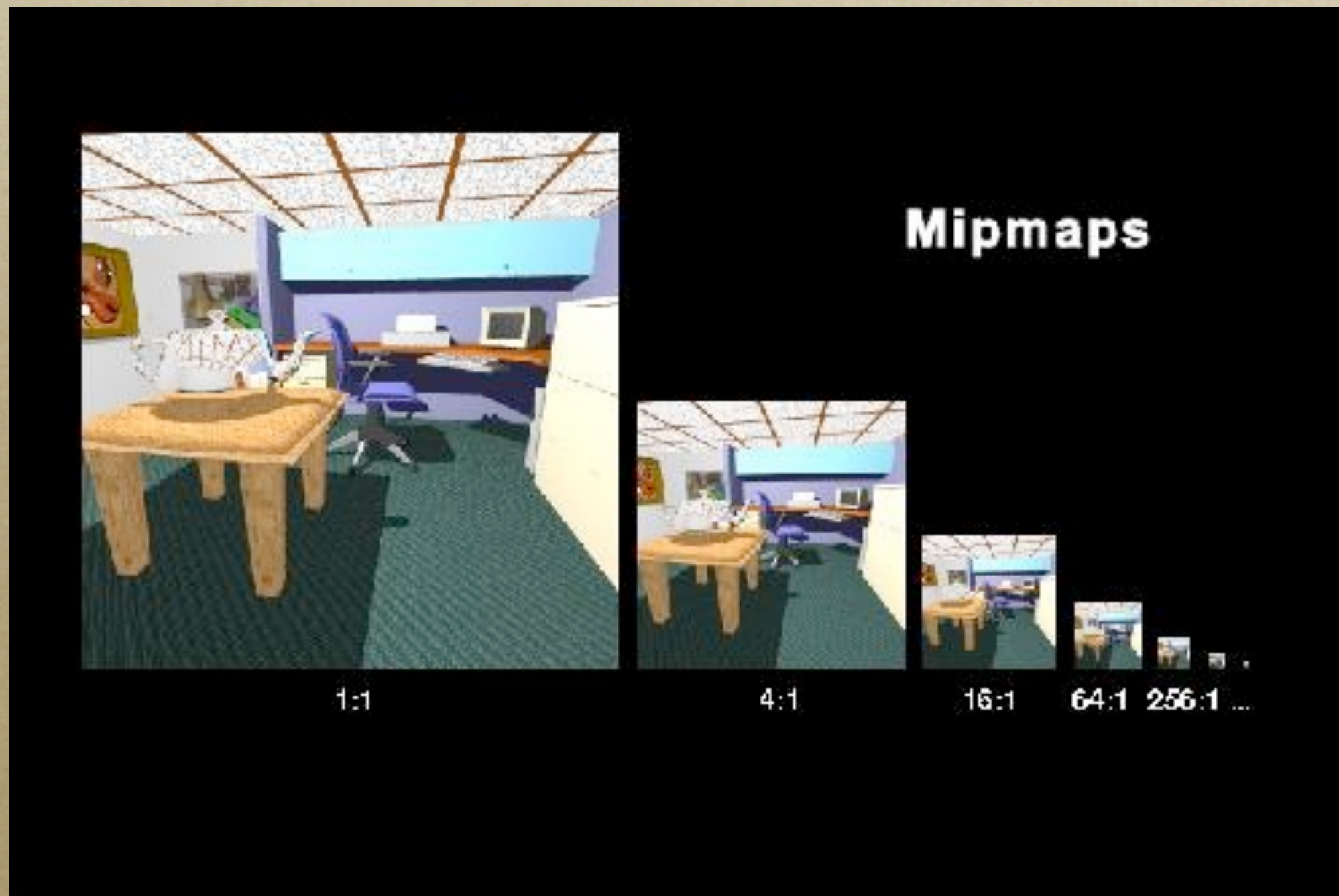
Change LoD with distance

- *Far distance colour cubes, impostors*
- *Nearer, small billboards, larger billboards*
- *Billboards with depth map*
- *Actual geometry*

Aliasing Problems



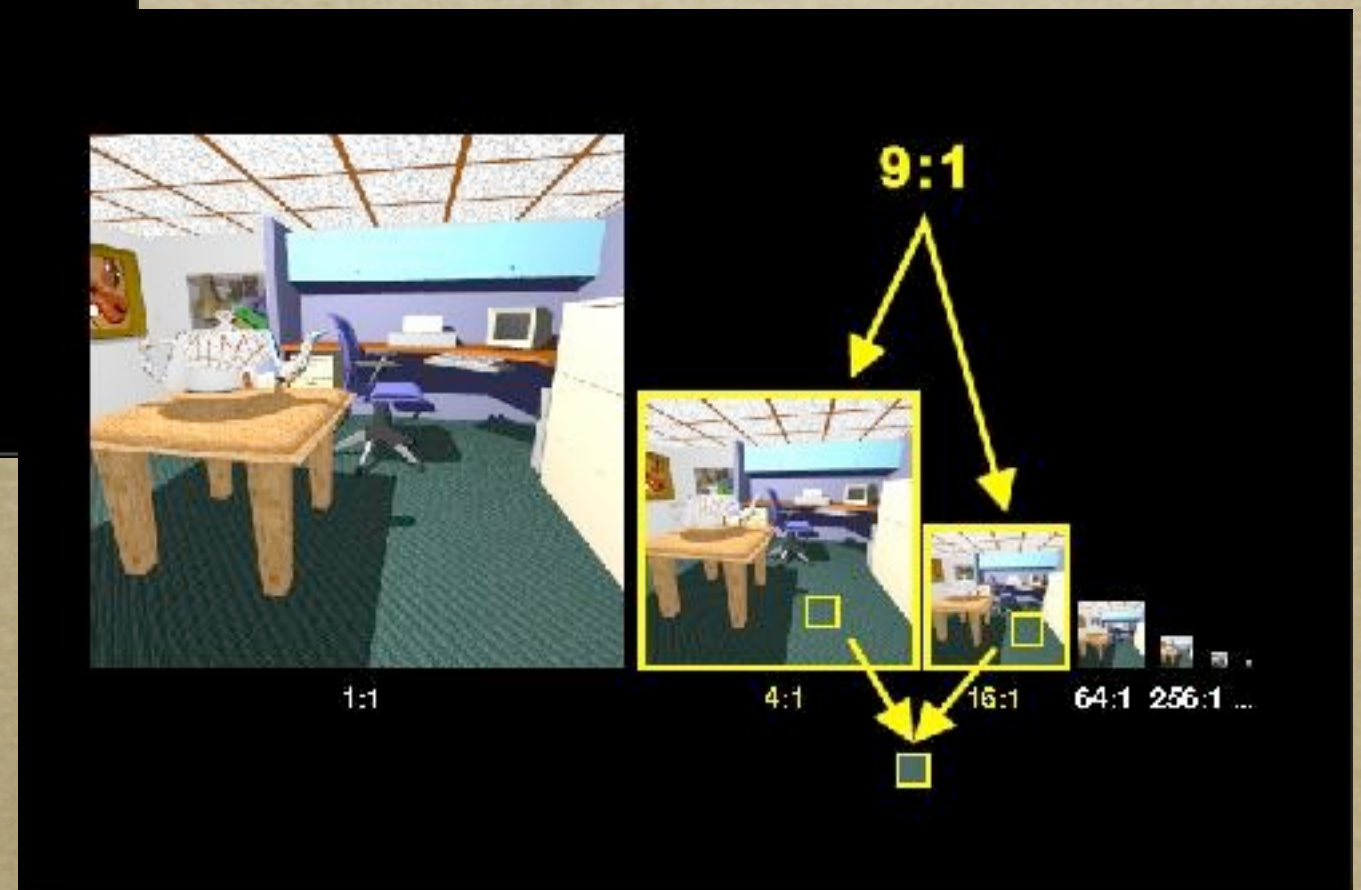
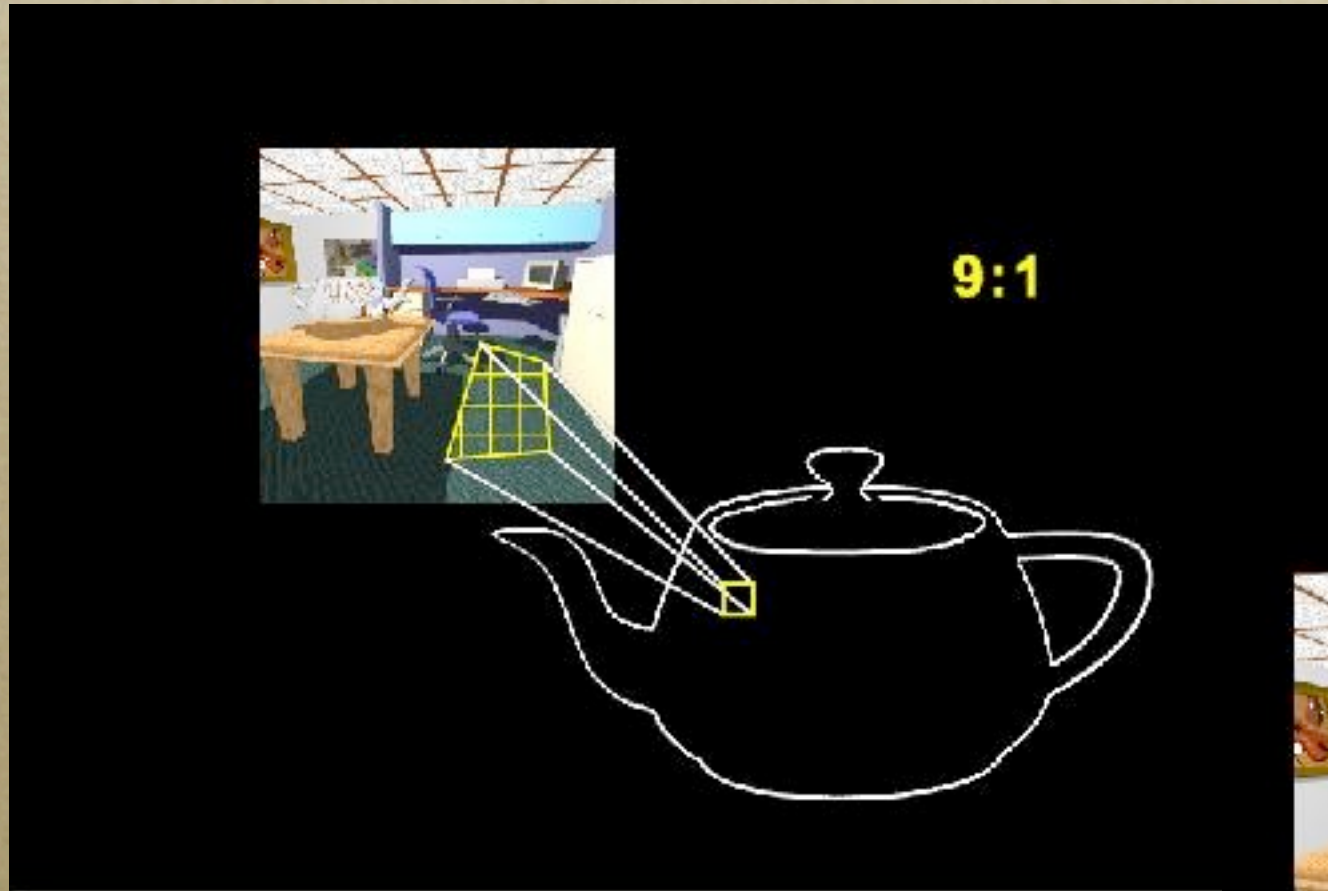
MIP Maps



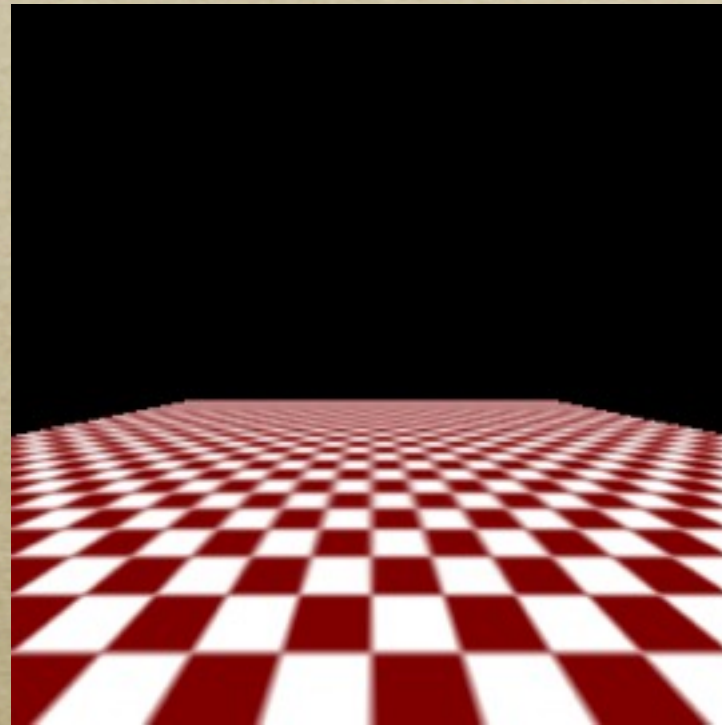
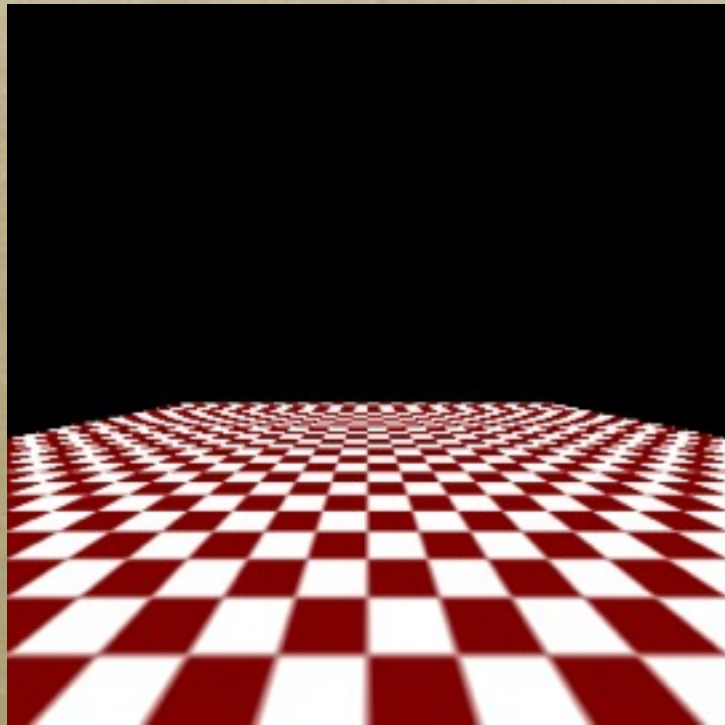
Multum in Parvo

- *Start with most detailed texture*
- *Reduce to half size by combining (averaging) adjacent four texels*
- *Continue to minimum*
- *Choose texture level according to distance*

Can also blend levels



Example



What's clever?

- *Binary tree contains twice as many nodes as leaves*
- *MIPmap is a tree with branch ratio of 4*
- *MIPmap uses about 34% more memory than raw texture*
- *Hardware support through GLU*

Question before Thursday

Why do we get green when we mix blue and yellow paint?

Last chance to find the answer yourself