

## Sample Results

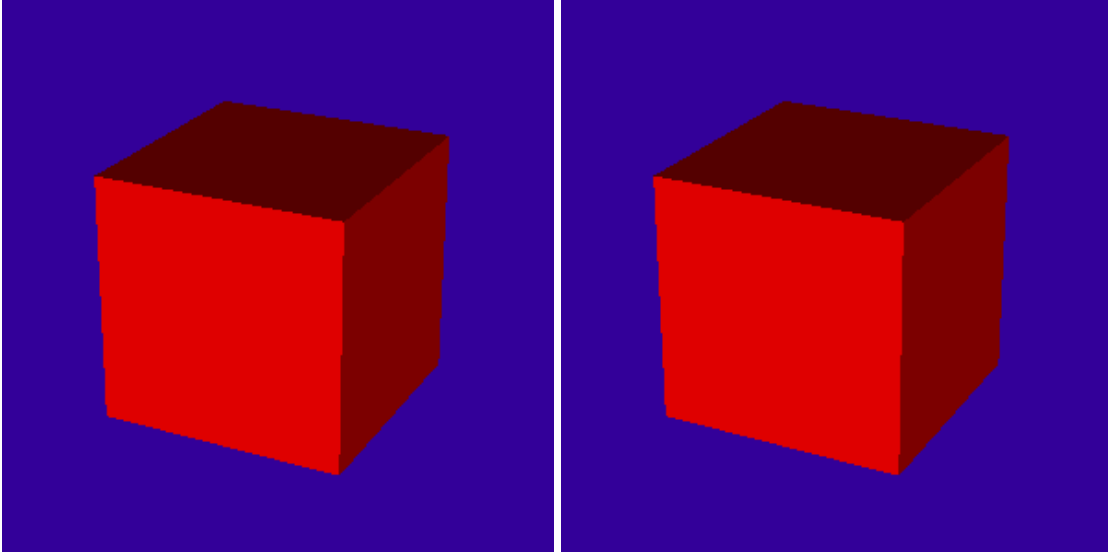
(your statistics will probably be a little different --- that's ok)

```
raytracer -input scene1_cube_mesh.txt -output out1_noshadows.tga -size 300 300 -no_shadows
```

```
*****
RAY TRACING STATISTICS
  total time           0:00:03
  num pixels           90000 (300x300)
  scene bounds         (-1.00 -1.00 -1.00) -> (1.00 1.00 1.00)
  num grid cells       0 (0x0x0)
  num non-shadow rays  90000
  num shadow rays      0
  total intersections  1080000
  total cells traversed 0
  rays per second      30000.0
  rays per pixel       1.0
  intersections per ray 12.0
  cells traversed per ray 0.0
*****
```

```
raytracer -input scene1_cube_mesh.txt -output out1.tga -size 300 300
```

```
*****
RAY TRACING STATISTICS
  total time           0:00:03
  num pixels           90000 (300x300)
  scene bounds         (-1.00 -1.00 -1.00) -> (1.00 1.00 1.00)
  num grid cells       0 (0x0x0)
  num non-shadow rays  90000
  num shadow rays      31656
  total intersections  1459872
  total cells traversed 0
  rays per second      40552.0
  rays per pixel       1.4
  intersections per ray 12.0
  cells traversed per ray 0.0
*****
```



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```
raytracer -input scene2_bunny_mesh_200.txt -output out2_noshadows.tga -size 300 300 -no_shadows
```

```
*****
RAY TRACING STATISTICS
total time                0:00:45
num pixels                90000 (300x300)
scene bounds              (-0.19 0.07 -0.11) -> (0.12 0.37 0.12)
num grid cells            0 (0x0x0)
num non-shadow rays       90000
num shadow rays           0
total intersections       18000000
total cells traversed     0
rays per second           2000.0
rays per pixel            1.0
intersections per ray     200.0
cells traversed per ray   0.0
*****
```

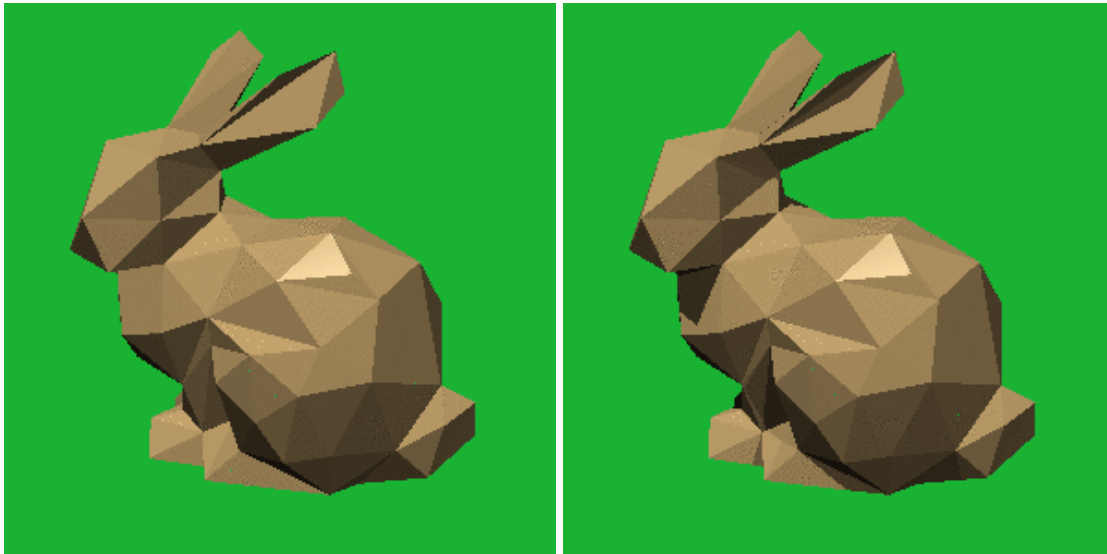
```
raytracer -input scene2_bunny_mesh_200.txt -output out2.tga -size 300 300
```

```
*****
RAY TRACING STATISTICS
total time                0:01:01
num pixels                90000 (300x300)
scene bounds              (-0.19 0.07 -0.11) -> (0.12 0.37 0.12)
num grid cells            0 (0x0x0)
num non-shadow rays       90000
num shadow rays           61594
total intersections       30318800
total cells traversed     0
rays per second           2485.1
rays per pixel            1.7
```

```

intersections per ray      200.0
cells traversed per ray    0.0
*****

```




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```

raytracer -input scene3_rasterize_sphere_5x5x5.txt -output out3_noshadows.tga -size 300
300 -no_shadows

```

```

*****
RAY TRACING STATISTICS
total time                0:00:01
num pixels                90000 (300x300)
scene bounds              (-1.50 -1.50 -1.50) -> (1.50 1.50 1.50)
num grid cells            0 (0x0x0)
num non-shadow rays       90000
num shadow rays           0
total intersections       90000
total cells traversed     108770
rays per second           90000.0
rays per pixel            1.0
intersections per ray     1.0
cells traversed per ray   1.2
*****

```

```

raytracer -input scene3_rasterize_sphere_5x5x5.txt -output out3.tga -size 300 300

```

```

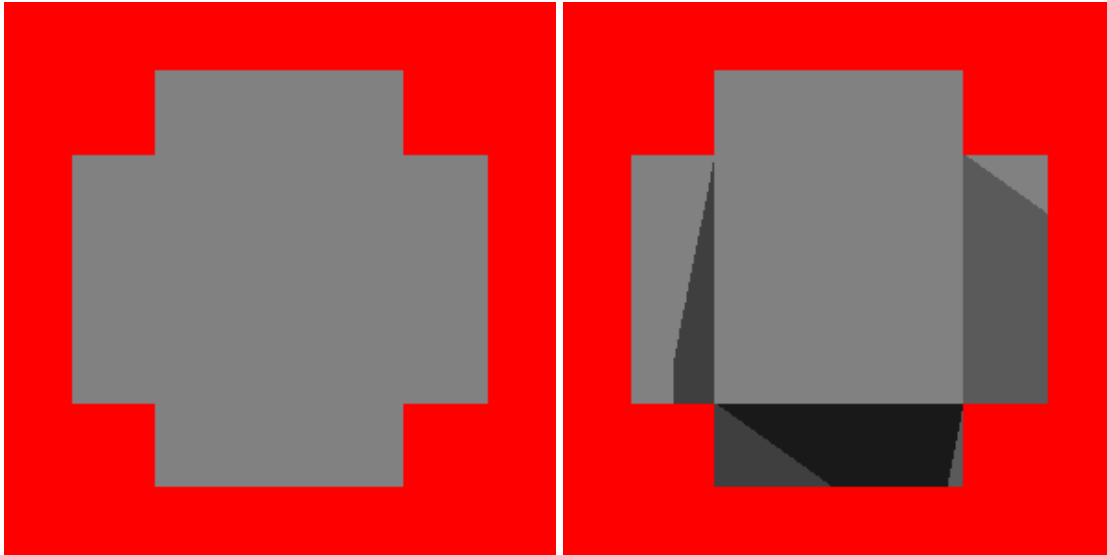
*****
RAY TRACING STATISTICS
total time                0:00:01
num pixels                90000 (300x300)
scene bounds              (-1.50 -1.50 -1.50) -> (1.50 1.50 1.50)
num grid cells            0 (0x0x0)
num non-shadow rays       90000
num shadow rays           85590

```

```

total intersections      175590
total cells traversed    209780
rays per second          175590.0
rays per pixel           2.0
intersections per ray    1.0
cells traversed per ray  1.2
*****

```




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```

raytracer -input scene4_rasterize_sphere_5x5x5.txt -output out4_noshadows.tga -size 300
300 -no_shadows

```

```

*****
RAY TRACING STATISTICS
total time                0:00:01
num pixels                90000 (300x300)
scene bounds              (-1.50 -1.50 -1.50) -> (1.50 1.50 1.50)
num grid cells            0 (0x0x0)
num non-shadow rays       90000
num shadow rays           0
total intersections       90000
total cells traversed     139282
rays per second           90000.0
rays per pixel            1.0
intersections per ray     1.0
cells traversed per ray   1.5
*****

```

```

raytracer -input scene4_rasterize_sphere_5x5x5.txt -output out4.tga -size 300 300

```

```

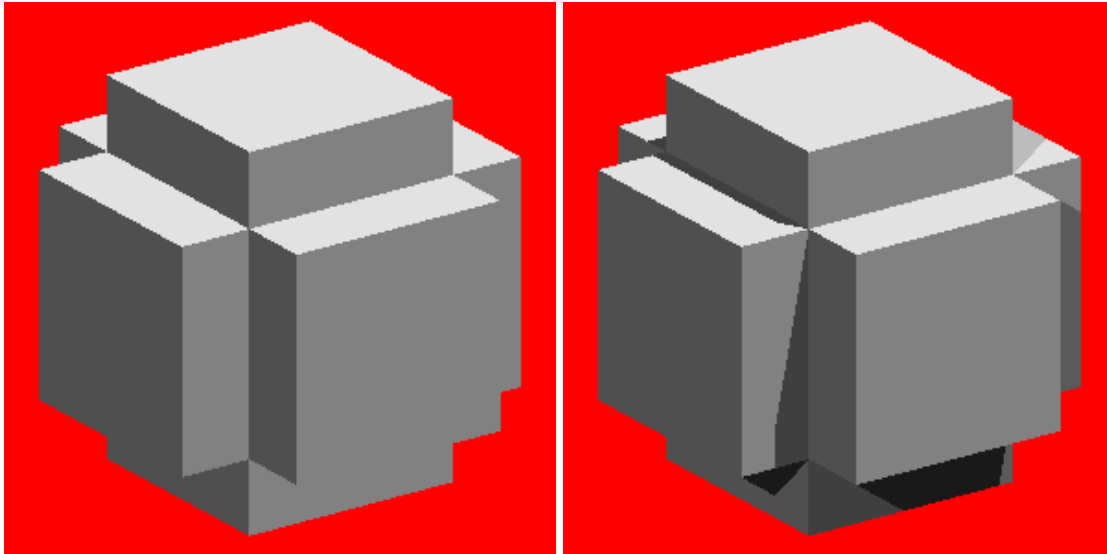
*****
RAY TRACING STATISTICS
total time                0:00:01
num pixels                90000 (300x300)

```

```

scene bounds          (-1.50 -1.50 -1.50) -> (1.50 1.50 1.50)
num grid cells        0 (0x0x0)
num non-shadow rays   90000
num shadow rays       114952
total intersections   204952
total cells traversed 239560
rays per second       204952.0
rays per pixel        2.3
intersections per ray 1.0
cells traversed per ray 1.2
*****

```




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```

raytracer -input scene5_rasterize_sphere_20x20x20.txt -output out5_noshadows.tga -size
300 300 -no_shadows

```

```

*****
RAY TRACING STATISTICS
total time           0:00:01
num pixels           90000 (300x300)
scene bounds        (-1.50 -1.50 -1.50) -> (1.50 1.50 1.50)
num grid cells       0 (0x0x0)
num non-shadow rays   90000
num shadow rays       0
total intersections   90000
total cells traversed 594191
rays per second       90000.0
rays per pixel        1.0
intersections per ray 1.0
cells traversed per ray 6.6
*****
[

```

```

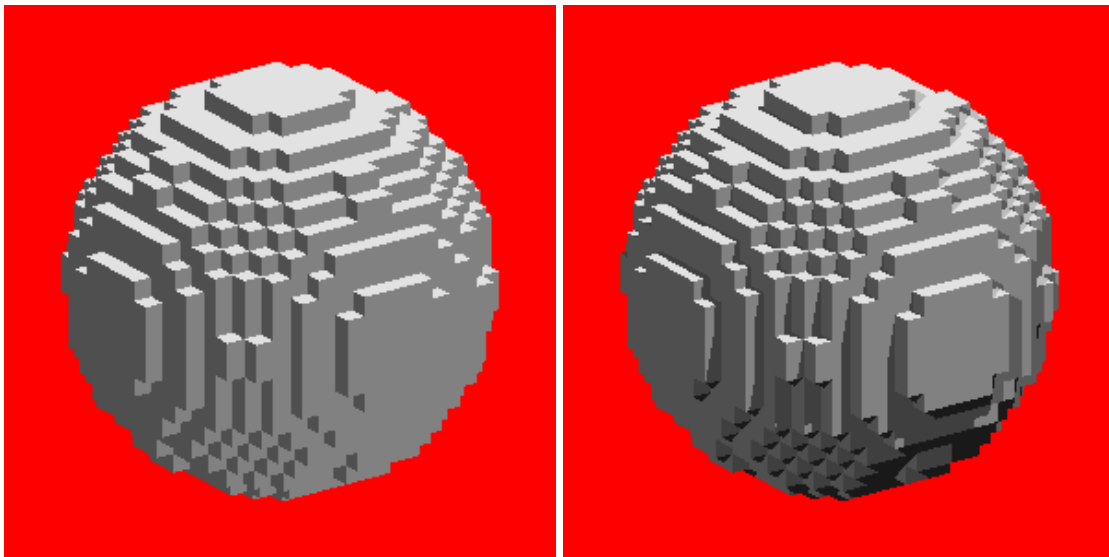
raytracer -input scene5_rasterize_sphere_20x20x20.txt -output out5.tga -size 300 300

```

```

*****
RAY TRACING STATISTICS
total time                0:00:01
num pixels                90000 (300x300)
scene bounds              (-1.50 -1.50 -1.50) -> (1.50 1.50 1.50)
num grid cells            0 (0x0x0)
num non-shadow rays       90000
num shadow rays           87060
total intersections       177060
total cells traversed     929248
rays per second           177060.0
rays per pixel            2.0
intersections per ray     1.0
cells traversed per ray   5.2
*****

```




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```

raytracer -input scene2_bunny_mesh_200.txt -output out_grid_200_10x10x10.tga -size
300 300 -grid 10 10 10 -visualize_grid -no_shadows

```

```

raytracer -input scene2_bunny_mesh_200.txt -output out_grid_200_10x10x10_count.tga
-size 300 300 -grid 10 10 10 -visualize_grid_count -no_shadows

```

```

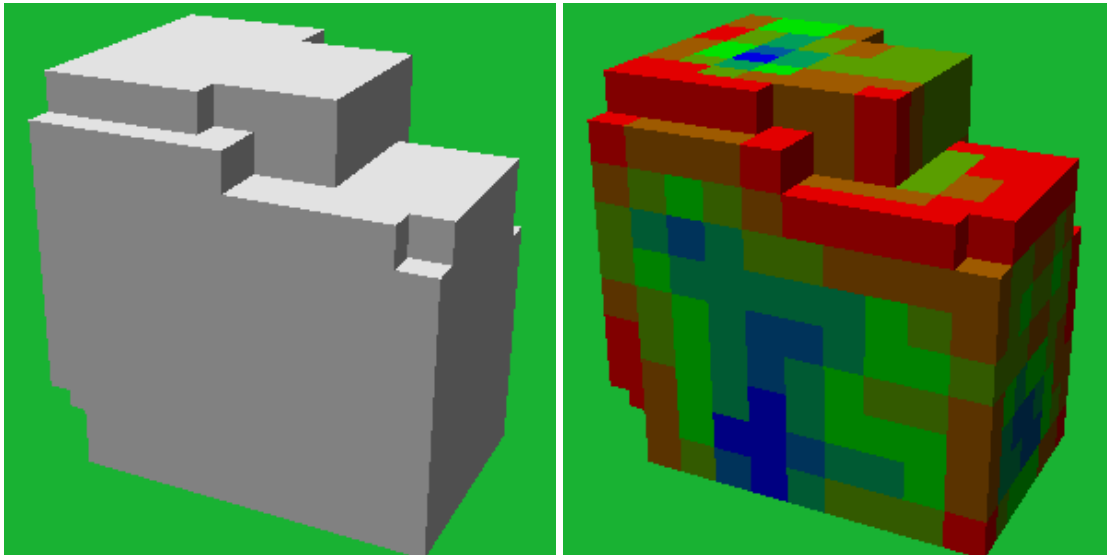
*****
RAY TRACING STATISTICS
total time                0:00:01
num pixels                90000 (300x300)
scene bounds              (-0.19 0.07 -0.11) -> (0.12 0.37 0.12)
num grid cells            1000 (10x10x10)
num non-shadow rays       90000
num shadow rays           0
total intersections       90000
total cells traversed     129844
rays per second           90000.0

```

```

rays per pixel          1.0
intersections per ray   1.0
cells traversed per ray 1.4
*****

```




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```

raytracer -input scene6_bunny_mesh_1k.txt -output out_grid_1k_20x20x20.tga -size 300
300 -grid 20 20 20 -visualize_grid -no_shadows

```

```

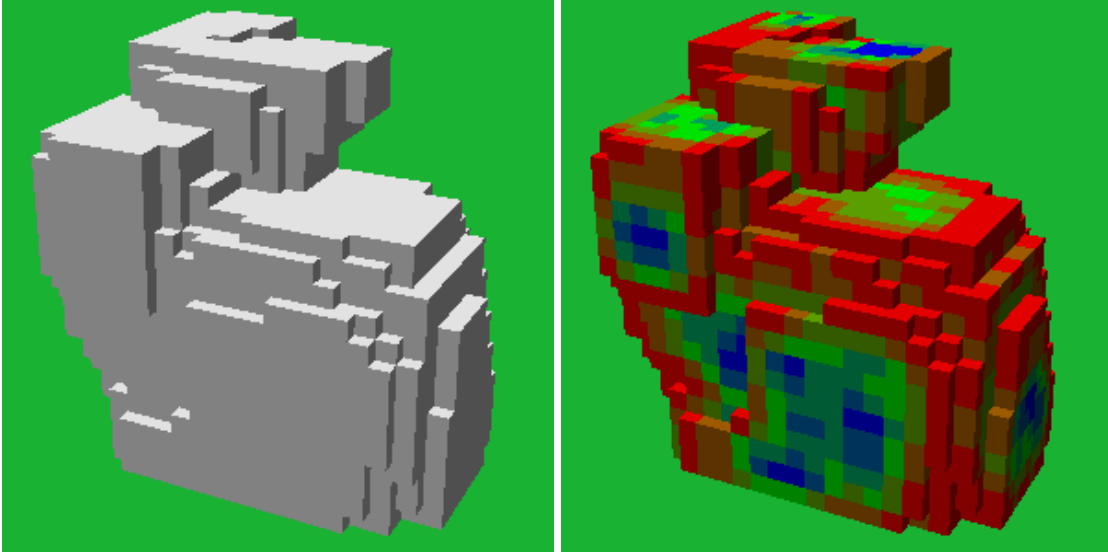
raytracer -input scene6_bunny_mesh_1k.txt -output out_grid_1k_20x20x20_count.tga -
size 300 300 -grid 20 20 20 -visualize_grid_count -no_shadows

```

```

*****
RAY TRACING STATISTICS
total time          0:00:01
num pixels          90000 (300x300)
scene bounds        (-0.19 0.07 -0.12) -> (0.12 0.37 0.12)
num grid cells      8000 (20x20x20)
num non-shadow rays 90000
num shadow rays     0
total intersections 90000
total cells traversed 430443
rays per second     90000.0
rays per pixel      1.0
intersections per ray 1.0
cells traversed per ray 4.8
*****

```



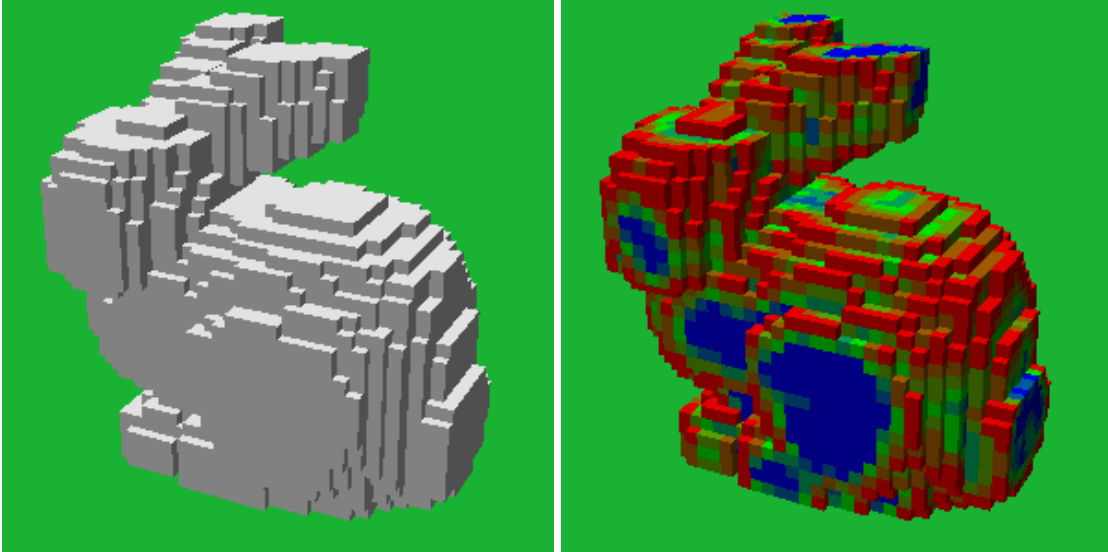
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```
raytracer -input scene7_bunny_mesh_5k.txt -output out_grid_5k_30x30x30.tga -size 300
300 -grid 30 30 30 -visualize_grid -no_shadows
```

```
raytracer -input scene7_bunny_mesh_5k.txt -output out_grid_5k_30x30x30_count.tga -
size 300 300 -grid 30 30 30 -visualize_grid_count -no_shadows
```

```
*****
RAY TRACING STATISTICS
  total time           0:00:01
  num pixels           90000 (300x300)
  scene bounds         (-0.19 0.07 -0.12) -> (0.12 0.37 0.12)
  num grid cells       27000 (30x30x30)
  num non-shadow rays  90000
  num shadow rays      0
  total intersections  90000
  total cells traversed 791788
  rays per second      90000.0
  rays per pixel       1.0
  intersections per ray 1.0
  cells traversed per ray 8.8
*****
```



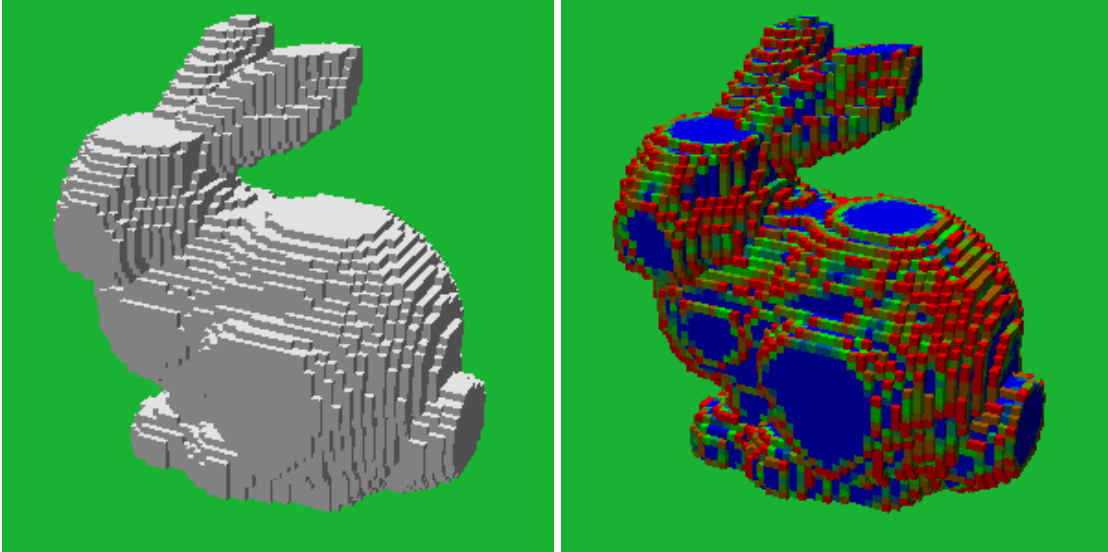



---

```
raytracer -input scene8_bunny_mesh_40k.txt -output out_grid_40k_50x50x50.tga -size
300 300 -grid 50 50 50 -visualize_grid -no_shadows
```

```
raytracer -input scene8_bunny_mesh_40k.txt -output out_grid_40k_50x50x50_count.tga
-size 300 300 -grid 50 50 50 -visualize_grid_count -no_shadows
```

```
*****
RAY TRACING STATISTICS
  total time           0:00:01
  num pixels           90000 (300x300)
  scene bounds         (-0.19 0.07 -0.12) -> (0.12 0.37 0.12)
  num grid cells       125000 (50x50x50)
  num non-shadow rays   90000
  num shadow rays       0
  total intersections   90000
  total cells traversed 1583123
  rays per second       90000.0
  rays per pixel        1.0
  intersections per ray 1.0
  cells traversed per ray 17.6
*****
```




---

```
raytracer -input scene2_bunny_mesh_200.txt -output out_200_10x10x10.tga -size 300
300 -grid 10 10 10
```

```
*****
RAY TRACING STATISTICS
total time                0:00:11
num pixels                90000 (300x300)
scene bounds              (-0.19 0.07 -0.11) -> (0.12 0.37 0.12)
num grid cells            1000 (10x10x10)
num non-shadow rays       90000
num shadow rays           61594
total intersections       5799886
total cells traversed     700221
rays per second           13781.3
rays per pixel            1.7
intersections per ray     38.3
cells traversed per ray   4.6
*****
```

```
raytracer -input scene6_bunny_mesh_1k.txt -output out_1k_20x20x20.tga -size 300 300 -
grid 20 20 20
```

```
*****
RAY TRACING STATISTICS
total time                0:00:14
num pixels                90000 (300x300)
scene bounds              (-0.19 0.07 -0.12) -> (0.12 0.37 0.12)
num grid cells            8000 (20x20x20)
num non-shadow rays       90000
num shadow rays           62774
total intersections       6971908
total cells traversed     1358956
rays per second           10912.4
```

```
rays per pixel          1.7
intersections per ray    45.6
cells traversed per ray  8.9
*****
```

```
raytracer -input scene7_bunny_mesh_5k.txt -output out_5k_30x30x30.tga -size 300 300 -
grid 30 30 30
```

```
*****
RAY TRACING STATISTICS
total time              0:00:20
num pixels              90000 (300x300)
scene bounds            (-0.19 0.07 -0.12) -> (0.12 0.37 0.12)
num grid cells          27000 (30x30x30)
num non-shadow rays     90000
num shadow rays         62984
total intersections     10369901
total cells traversed   1977321
rays per second         7649.2
rays per pixel          1.7
intersections per ray   67.8
cells traversed per ray 12.9
*****
```

```
raytracer -input scene8_bunny_mesh_40k.txt -output out_40k_50x50x50.tga -size 300
300 -grid 50 50 50
```

```
*****
RAY TRACING STATISTICS
total time              0:00:35
num pixels              90000 (300x300)
scene bounds            (-0.19 0.07 -0.12) -> (0.12 0.37 0.12)
num grid cells          125000 (50x50x50)
num non-shadow rays     90000
num shadow rays         62980
total intersections     19949589
total cells traversed   3261568
rays per second         4370.9
rays per pixel          1.7
intersections per ray   130.4
cells traversed per ray 21.3
*****
```

