CLAIMS

What is claimed is:

1. A method comprising:

determining the sign of a determinant of vertices on a triangle undergoing motion blur and depth of field; and

based on said sign, deciding whether to backface cull the triangle.

2. The method of claim 1 including determining the sign of a determinant of vertices of a triangle where, for each vertex, the depth of field effect can be represented by a function of two lens coordinates u and v and the vertex motion represented by a function of time.

3. The method of claim 2 including determining the sign of a determinant of vertices on a triangle where each vertex moves according to a polynomial function in time.

4. The method of claim 3 including determining the sign of a determinant of vertices on a triangle where each vertex moves linearly in time.

5. The method of claim 3 including determining the sign of Bernstein coefficients and using the sign to determine if a triangle can be backface culled.

6. The method of claim 3 including determining if a moving triangle can change facing for single viewpoint.

7. The method of claim 2 including determining if a static triangle changes facing for any viewpoint within a lens.

8. The method of claim 2 including bounding the polynomial of an equation for the determinant using bounded arithmetic.

9. The method of claim 2 including approximating a lens with a square.

10. The method of claim 1 including determining whether a triangle can be culled by first checking backface status at the middle of a lens and only if the triangle is

backfacing at the center of the lens, proceeding with the full backface test, otherwise reporting that the triangle is potentially visible.

11. An apparatus comprising:

a processor to determine the sign of a determinant of vertices of a triangle undergoing motion blur and depth of field and, based on the sign, to decide whether to backface cull the triangle; and

a memory coupled to said processor.

12. The apparatus of claim 11 wherein said apparatus is a graphics processor.

13. The apparatus of claim 11, said processor to determine the sign of a determinant of vertices of a triangle where, for each vertex, the depth of field effect can be represented by a function of two lens coordinates u and v and the vertex motion represented by a function of time.

14. The apparatus of claim 13, said processor to determine the sign of the determinant where each vertex moves according to a polynomial function in time.

15. The apparatus of claim 14, said processor to determine the sign of the determinant of vertices of a triangle where each vertex moves linearly in time.

16. The apparatus of claim 14, said processor to determine the sign of Bernstein coefficients and use the sign to determine if a triangle can be backface culled.

17. The apparatus of claim 14, said processor to determine if a moving triangle can change facing for a single viewpoint.

18. The apparatus of claim 13, said processor to determine if a static triangle changes facing for any viewpoint within a lens.

19. The apparatus of claim 13, said processor to bound the polynomial of an equation for the determinant using bounded arithmetic.

What is claimed is:

1. A method comprising:

determining, using a computer, the sign of a determinant of vertices on a triangle undergoing motion blur and depth of field, including determining the sign of a determinant of vertices of a triangle where, for each vertex, the depth of field effect can be represented by a function of two lens coordinates u and v and the vertex motion represented by a function of time; and

based on said sign, deciding whether to backface cull the triangle.

2. The method of claim 1 including determining the sign of a determinant of vertices on a triangle where each vertex moves according to a polynomial function in time.

3. The method of claim 2 including determining the sign of a determinant of vertices on a triangle where each vertex moves linearly in time.

4. The method of claim 2 including determining the sign of Bernstein coefficients and using the sign to determine if a triangle can be backface culled.

5. The method of claim 2 including determining if a moving triangle can change facing for single viewpoint.

6. The method of claim 1 including determining if a static triangle changes facing for any viewpoint within a lens.

7. The method of claim 1 including bounding the polynomial of an equation for the determinant using bounded arithmetic.

8. The method of claim 1 including approximating a lens with a square.

9. The method of claim 1 including determining whether a triangle can be culled by first checking backface status at the middle of a lens and only if the triangle is backfacing at the center of the lens, proceeding with the full backface test, otherwise reporting that the triangle is potentially visible.

10. A non-transitory computer readable medium storing instructions to enable a computer to:

determine, using a computer, the sign of a determinant of vertices of a triangle undergoing motion blur and depth of field, including determining the sign of a determinant of vertices of a triangle where, for each vertex, the depth of field effect can be represented by a function of two lens coordinates u and v and the vertex motion represented by a function of time; and

based on said sign, decide whether to backface cull the triangle.

11. The medium of claim 10 further storing instructions to determine the sign of a determinant of vertices of a triangle where each vertex moves according to the polynomial function in time.

12. The medium of claim 11 further storing instructions to determine the sign of a determinant of vertices of a triangle where each vertex moves linearly in time.

13. The medium of claim 11 further storing instructions to determine the sign of Bernstein coefficients and use the sign to determine if a triangle can be backface culled.

14. The medium of claim 11 further storing instructions to determine if a moving triangle can change facing for a single viewpoint.

15. The medium of claim 10 further storing instructions to determine if a static triangle changes facing for any viewpoint within a lens.

16. The medium of claim 10 further storing instructions to bound the polynomial of an equation for the determinant using bounded arithmetic.

17. The medium of claim 10 further storing instructions to approximate the lens with the square.

18. The medium of claim 10 further storing instructions to determine whether a triangle can be culled by first checking backface status at the middle of a lens and only if the triangle is backfacing at the center of the lens, proceed with the full backface test, otherwise report that the triangle is potentially visible.

19. An apparatus comprising:

a processor to determine, using a computer, the sign of a determinant of vertices of a triangle undergoing motion blur

and depth of field and, based on the sign, to decide whether to backface cull the triangle, said processor to determine the sign of a determinant of vertices of a triangle where, for each vertex, the depth of field effect can be represented by a function of two lens coordinates u and v and the vertex motion represented by a function of time; and

a memory coupled to said processor.

20. The apparatus of claim 19 wherein said apparatus is a graphics processor.

21. The apparatus of claim 19, said processor to determine the sign of the determinant where each vertex moves according to a polynomial function in time.

22. The apparatus of claim 21, said processor to determine the sign of the determinant of vertices of a triangle where each vertex moves linearly in time.

23. The apparatus of claim 21, said processor to determine the sign of Bernstein coefficients and use the sign to determine if a triangle can be backface culled.

24. The apparatus of claim 21, said processor to determine if a moving triangle can change facing for a single viewpoint.

25. The apparatus of claim 19, said processor to determine if a static triangle changes facing for any viewpoint within a lens.

26. The apparatus of claim 19, said processor to bound the polynomial of an equation for the determinant using bounded arithmetic.