CLAIMS

What is claimed is:

1. A method for coarse pixel shading (CPS) comprising:

pre-processing a graphics mesh by creating a tangent-plane parameterization of desired vertex attributes for each vertex of the mesh; and

performing rasterization of the mesh in a rasterization stage of a graphics pipeline using the tangent-plane parameterization.

2. The method as in claim 1 wherein pre-processing the graphics mesh further comprises:

for each vertex of the mesh, collecting neighboring triangles.

3. The method as in claim 2 wherein pre-processing the graphics mesh further comprises:

iterating over the triangles in the neighborhoods and projecting them into tangent planes.

4. The method as in claim 3 wherein pre-processing the graphics mesh further comprises:

setting up and averaging linear attribute equations for each vertex.

5. The method as in claim 4 wherein performing rasterization further comprises:

setting up plane equations in a vertex shader.

6. The method as in claim 5 wherein the plane equations comprise per-vertex tangent plane equations.

7. The method as in claim 6 wherein performing rasterization further comprises:

making the plane equations visible to a pixel shader without interpolation.

8. The method as in claim 7 wherein performing rasterization further comprises:

determining by the pixel shader modified texture derivatives based on a plurality of vertex tangent planes.

9. The method as in claim 8 wherein the pixel shader further interpolates results using barycentric coordinates.

10. A machine-readable medium for coarse pixel shading (CPS) having program code stored thereon which, when executed by a machine, causes the machine to perform the operations of:

pre-processing a graphics mesh by creating a tangent-plane parameterization of desired vertex attributes for each vertex of the mesh;

performing rasterization of the mesh in a rasterization stage of a graphics pipeline using the tangent-plane parameterization.

11. The machine-readable medium as in claim 10 wherein pre-processing the graphics mesh further comprises:

for each vertex of the mesh, collecting neighboring triangles.

12. The machine-readable medium as in claim 11 wherein pre-processing the graphics mesh further comprises:

iterating over the triangles in the neighborhoods and projecting them into tangent planes.

13. The machine-readable medium as in claim 12 wherein pre-processing the graphics mesh further comprises:

setting up and averaging linear attribute equations for each vertex.

14. The machine-readable medium as in claim 13 wherein performing rasterization further comprises:

setting up plane equations in a vertex shader.

15. The machine-readable medium as in claim 14 wherein the plane equations comprise per-vertex tangent plane equations.

16. The machine-readable medium as in claim 15 wherein performing rasterization further comprises:

making the plane equations visible to a pixel shader without interpolation.

17. The machine-readable medium as in claim 16 wherein performing rasterization further comprises:

determining by a pixel shader modified texture derivatives based on a plurality of vertex tangent planes.

18. The machine-readable medium as in claim 17 wherein the pixel shader further interpolates results using barycentric coordinates.

19. An apparatus for coarse pixel shading (CPS) comprising:

preprocessing logic to pre-process a graphics mesh prior to rasterization by creating a tangent-plane parameterization of desired vertex attributes for each vertex of the mesh; and

a rasterization stage of a graphics pipeline to perform rasterization of the mesh using the tangent-plane parameterization.

20. The apparatus as in claim 19 wherein pre-processing the graphics mesh further comprises:

for each vertex of the mesh, collecting neighboring triangles.

21. The apparatus as in claim 20 wherein pre-processing the graphics mesh further comprises:

iterating over the triangles in the neighborhoods and projecting them into tangent planes.

22. The apparatus as in claim 21 wherein pre-processing the graphics mesh further comprises:

setting up and averaging linear attribute equations for each vertex.

23. The apparatus as in claim 22 wherein the rasterization stage comprises:

a vertex shader to set up plane equations.

24. The apparatus as in claim 23 wherein the plane equations comprise per-vertex tangent plane equations.

25. The apparatus as in claim 24 wherein the rasterization stage comprises:

a geometry shader to make the plane equations visible to a pixel shader without interpolation.

CLAIMS

What is claimed is:

1. A method for coarse pixel shading (CPS) comprising:

pre-processing a graphics mesh by creating a tangent-plane parameterization of desired vertex attributes for each vertex of the mesh; and

performing rasterization of the mesh in a rasterization stage of a graphics pipeline using the tangent-plane parameterization.

2. The method as in claim 1 wherein pre-processing the graphics mesh further comprises:

for each vertex of the mesh, collecting neighboring triangles.

3. The method as in claim 2 wherein pre-processing the graphics mesh further comprises:

iterating over the triangles in the neighborhoods and projecting them into tangent planes.

4. The method as in claim 3 wherein pre-processing the graphics mesh further comprises:

setting up and averaging linear attribute equations for each vertex.

5. The method as in claim 4 wherein performing rasterization further comprises:

setting up plane equations in a vertex shader.

6. The method as in claim 5 wherein the plane equations comprise per-vertex tangent plane equations.

7. The method as in claim 6 wherein performing rasterization further comprises:

making the plane equations visible to a pixel shader without interpolation.

8. The method as in claim 7 wherein performing rasterization further comprises:

determining by the pixel shader modified texture derivatives based on a plurality of vertex tangent planes.

9. The method as in claim 8 wherein the pixel shader further interpolates results using barycentric coordinates.

10. A machine-readable medium for coarse pixel shading (CPS) having program code stored thereon which, when executed by a machine, causes the machine to perform the operations of:

pre-processing a graphics mesh by creating a tangent-plane parameterization of desired vertex attributes for each vertex of the mesh;

performing rasterization of the mesh in a rasterization stage of a graphics pipeline using the tangent-plane parameterization.

11. The machine-readable medium as in claim 10 wherein pre-processing the graphics mesh further comprises:

for each vertex of the mesh, collecting neighboring triangles.

12. The machine-readable medium as in claim 11 wherein pre-processing the graphics mesh further comprises:

iterating over the triangles in the neighborhoods and projecting them into tangent planes.

13. The machine-readable medium as in claim 12 wherein pre-processing the graphics mesh further comprises:

setting up and averaging linear attribute equations for each vertex.

14. The machine-readable medium as in claim 13 wherein performing rasterization further comprises:

setting up plane equations in a vertex shader.

15. The machine-readable medium as in claim 14 wherein the plane equations comprise per-vertex tangent plane equations.

16. The machine-readable medium as in claim 15 wherein performing rasterization further comprises:

making the plane equations visible to a pixel shader without interpolation.

17. The machine-readable medium as in claim 16 wherein performing rasterization further comprises:

determining by a pixel shader modified texture derivatives based on a plurality of vertex tangent planes.

18. The machine-readable medium as in claim 17 wherein the pixel shader further interpolates results using barycentric coordinates.

19. An apparatus for coarse pixel shading (CPS) comprising:

preprocessing logic to pre-process a graphics mesh prior to rasterization by creating a tangent-plane parameterization of desired vertex attributes for each vertex of the mesh; and

a rasterization stage of a graphics pipeline to perform rasterization of the mesh using the tangent-plane parameterization.

20. The apparatus as in claim 19 wherein pre-processing the graphics mesh further comprises:

for each vertex of the mesh, collecting neighboring triangles.

21. The apparatus as in claim 20 wherein pre-processing the graphics mesh further comprises:

iterating over the triangles in the neighborhoods and projecting them into tangent planes.

22. The apparatus as in claim 21 wherein pre-processing the graphics mesh further comprises:

setting up and averaging linear attribute equations for each vertex.

23. The apparatus as in claim 22 wherein the rasterization stage comprises:

a vertex shader to set up plane equations.

24. The apparatus as in claim 23 wherein the plane equations comprise per-vertex tangent plane equations.

25. The apparatus as in claim 24 wherein the rasterization stage comprises:

a geometry shader to make the plane equations visible to a pixel shader without interpolation.

26. The apparatus as in claim 25 wherein the rasterization stage further comprises:

the pixel shader to determine modified texture derivatives based on a plurality of vertex tangent planes.

27. The apparatus as in claim 26 wherein the pixel shader further interpolates results using barycentric coordinates.