CLAIMS

What is claimed is:

1. A device to render two-dimensional (2D) imagery from three-dimensional (3D) model data comprising:

a fine rasterizing component to employ multiple screen image samples per screen image pixel of a screen image to perform fine rasterization of a 3D model to identify a set of visible primitives of the 3D model that are visible from a perspective of the screen image;

a coarse rasterizing component to employ a single shading image sample per shading image pixel of a shading image that corresponds to the screen image to perform coarse rasterization of the 3D model from the perspective of the screen image to identify at least one primitive along a path of a shading image pixel; and

a shading component to shade a primitive identified by a screen image sample of a first screen image pixel as visible within the shading image pixel and identified as along the path of the shading image sample associated with the shading image pixel to derive a first color value.

2. The device of claim 1, the fine rasterizing component to generate a multitude of shading point identifiers (SPIDs) to correlate a multitude of screen image samples comprising the first and second sets of screen image samples to a multitude of shading image pixels of the shading image, each SPID of the multitude of SPIDs associated with a screen image sample of a multitude of screen image samples, and each SPID to correlate a visible primitive of the set of visible primitives to a shading image pixel of the multitude of shading image pixels.

3. The device of claim 2, each SPID of the multitude of SPIDs comprising:

an identifier assigned to a visible primitive of the set of visible primitives;

coordinates of a shading image pixel of the multitude shading image pixels in which the screen image sample associated with the SPID falls; and

an indication of a depth of the visible primitive within the shading image pixel associated with the coordinates.

4. The device of claim 3, comprising a shading constraint component to generate from the multitude of SPIDs a set of lists of visible primitives of the set of visible primitives, each list of the set of lists associated with a shading image pixel of the multitude of shading image pixels, and each list comprising at least one identifier of at least one visible primitive of the set of visible primitives that is visible within the shading image pixel associated with the list and an indication of a depth of the at least one visible primitive within the shading image pixel.

5. The device of claim 4, the shading component to compare an identifier of the at least one primitive to the at least one identifier of a list of the set of lists associated with a single shading image pixel to determine whether to shade the at least one primitive in the single shading image pixel.

6. The device of claim 2, comprising a filtering component to include a color value associated with a second screen image pixel adjacent the first screen image pixel in the screen image in the determination of the second color value to impart at least one of a motion blur effect or a depth-of-field effect to at least one object depicted in the screen image.

7. The device of claim 1, the fine rasterizing component to employ at least one of supersampling, multisampling, stochastic sampling, stochastic sampling over a time dimension, stochastic sampling over a lens dimension or ray tracing.

8. The device of claim 1, comprising a display to present the screen image.

9. A device to render two-dimensional (2D) imagery from three-dimensional (3D) model data comprising:

a shading component to shade a primitive visible within a shading image pixel of a shading image that corresponds to a screen image to determine a first color value of the shading image pixel;

a resolving component to assign the first color value to each screen image sample of a first set of screen image samples of a 3D model that falls within the shading image pixel; and

a sample averaging component to average color values of a second set of screen image samples of the 3D model that falls within a first screen image pixel of the screen image to determine a second color value of the first screen image pixel, the first screen image pixel at least partially coinciding with the shading image pixel, and the second set of screen image samples differing from and sharing at least one screen image sample with the first set of screen image samples.

10. The device of claim 9, comprising a fine rasterizing component to employ a multitude of screen image samples to rasterize the 3D model to identify a set of visible primitives of the 3D model that are visible from a perspective of the screen image and to generate a multitude of shading point identifiers (SPIDs) to correlate the multitude of screen image samples to a multitude of shading image pixels of the shading image, each SPID of the multitude of SPIDs associated with a screen image sample of the multitude of screen image samples that comprises

the first and second sets of screen image samples, and each SPID to correlate a visible primitive of the set of visible primitives to a shading image pixel of the multitude of shading image pixels.

11. The device of claim 10, each SPID of the multitude of SPIDs comprising:

an identifier assigned to a visible primitive of the set of visible primitives;

coordinates of a shading image pixel of the multitude shading image pixels in which the screen image sample associated with the SPID falls; and

an indication of a depth of the visible primitive within the shading image pixel associated with the coordinates.

12. The device of claim 11, comprising a shading constraint component to generate from the multitude of SPIDs a set of lists of visible primitives of the set of visible primitives, each list of the set of lists associated with a shading image pixel of the multitude of shading image pixels, and each list comprising at least one identifier of at least one visible primitive of the set of visible primitives that is visible within the shading image pixel associated with the list and an indication of a depth of the at least one visible primitive within the shading image pixel.

13. The device of claim 12, comprising a coarse shading component to employ a single shading image sample associated with a single shading image pixel of the multitude of shading image pixels to identify at least one primitive of the 3D model that exists along a path of the single shading image sample through the 3D model, the shading component to compare an identifier of the at least one primitive to the at least one identifier of a list of the set of lists associated with the single shading image pixel to determine whether to shade the at least one primitive in the single shading image pixel.

14. The device of claim 9, comprising a filtering component to include a color value associated with a second screen image pixel adjacent the first screen image pixel in the screen image in the determination of the second color value to impart at least one of a motion blur effect or a depth-of-field effect to at least one object depicted in the screen image.

15. The device of claim 10, the fine rasterizing component to employ at least one of supersampling, multisampling, stochastic sampling, stochastic sampling over a time dimension, stochastic sampling over a lens dimension or ray tracing.

16. The device of claim 9, comprising an interface to transmit screen image data representing the screen image to another device.

17. A computer-implemented method for rendering two-dimensional (2D) imagery from three-dimensional (3D) model data comprising:

employing multiple screen image samples per screen image pixel of a screen image to perform fine rasterization of a 3D model to identify a set of visible primitives of the 3D model that are visible from a perspective of the screen image;

employing a single shading image sample per shading image pixel of a shading image that corresponds to the screen image to perform coarse rasterization of the 3D model from the perspective of the screen image to identify at least one primitive along a path of a shading image pixel; and

shading a primitive identified by a screen image sample of a first screen image pixel as visible within the shading image pixel and identified as along the path of the shading image sample associated with the shading image pixel to derive a first color value.

18. The computer-implemented method of claim 17, the method comprising:

assigning the first color value to each screen image sample of a first set of screen image samples of the 3D model that falls within the shading image pixel; and

averaging color values of a second set of screen image samples of the 3D model that falls within the first screen image pixel to determine a second color value of the first screen image pixel, the first screen image pixel at least partially coinciding with the shading image pixel, and the second set of screen image samples differing from and sharing at least one screen image sample with the first set of screen image samples.

19. The computer-implemented method of claim 17, the method comprising generating a multitude of shading point identifiers (SPIDs) to correlate a multitude of screen image samples comprising the first and second sets of screen image samples to a multitude of shading image pixels of the shading image, each SPID of the multitude of SPIDs associated with a screen image sample of a multitude of screen image samples, and each SPID to correlate a visible primitive of the set of visible primitives to a shading image pixel of the multitude of shading image pixels.

20. The computer-implemented method of claim 19, each SPID of the multitude of SPIDs comprising:

an identifier assigned to a visible primitive of the set of visible primitives;

coordinates of a shading image pixel of the multitude shading image pixels in which the screen image sample associated with the SPID falls; and

an indication of a depth of the visible primitive within the shading image pixel associated with the coordinates.

21. The computer-implemented method of claim 20, the method comprising redistributing identifiers among at least a subset of the SPIDs of the multitude of SPIDs to impart at least one of a motion blur effect or a depth-of-field effect.

22. The computer-implemented method of claim 20, the method comprising generating from the multitude of SPIDs a set of lists of visible primitives of the set of visible primitives, each list of the set of lists associated with a shading image pixel of the multitude of shading image pixels, and each list comprising at least one identifier of at least one visible primitive of the set of visible primitives that is visible within the shading image pixel associated with the list and an indication of a depth of the at least one visible primitive within the shading image pixel.

23. The computer-implemented method of claim 18, the method comprising including a color value associated with a second screen image pixel adjacent the first screen image pixel in the screen image in determining the second color value to impart at least one of a motion blur effect or a depth-of-field effect to at least one object depicted in the screen image.

24. The computer-implemented method of claim 17, the method comprising transmitting screen image data representing the screen image to another device.

25. At least one tangible machine-readable storage medium comprising instructions that when executed by a computing device, cause the computing device to perform the method of any of claims 17-24.

CLAIMS

What is claimed is:

1. A device to render two-dimensional (2D) imagery from three-dimensional (3D) model data comprising:

a fine rasterizing component to employ multiple screen image samples per screen image pixel of a screen image to perform fine rasterization of a 3D model to identify a set of visible primitives of the 3D model that are visible from a perspective of the screen image;

a coarse rasterizing component to employ a single shading image sample per shading image pixel of a shading image that corresponds to the screen image to perform coarse rasterization of the 3D model from the perspective of the screen image to identify at least one primitive along a path of a shading image pixel; and

a shading component to shade a primitive identified by a screen image sample of a first screen image pixel as visible within the shading image pixel and identified as along the path of the shading image sample associated with the shading image pixel to derive a first color value.

2. The device of claim 1, the fine rasterizing component to generate a multitude of shading point identifiers (SPIDs) to correlate a multitude of screen image samples comprising the first and second sets of screen image samples to a multitude of shading image pixels of the shading image, each SPID of the multitude of SPIDs associated with a screen image sample of a multitude of screen image samples, and each SPID to correlate a visible primitive of the set of visible primitives to a shading image pixel of the multitude of shading image pixels.

3. The device of claim 2, each SPID of the multitude of SPIDs comprising:

an identifier assigned to a visible primitive of the set of visible primitives;

coordinates of a shading image pixel of the multitude shading image pixels in which the screen image sample associated with the SPID falls; and

an indication of a depth of the visible primitive within the shading image pixel associated with the coordinates.

4. The device of claim 3, comprising a shading constraint component to generate from the multitude of SPIDs a set of lists of visible primitives of the set of visible primitives, each list of the set of lists associated with a shading image pixel of the multitude of shading image pixels, and each list comprising at least one identifier of at least one visible primitive of the

set of visible primitives that is visible within the shading image pixel associated with the list and an indication of a depth of the at least one visible primitive within the shading image pixel.

5. The device of claim 4, the shading component to compare an identifier of the at least one primitive to the at least one identifier of a list of the set of lists associated with a single shading image pixel to determine whether to shade the at least one primitive in the single shading image pixel.

6. The device of claim 1, the fine rasterizing component to employ at least one of supersampling, multisampling, stochastic sampling, stochastic sampling over a time dimension, stochastic sampling over a lens dimension or ray tracing.

7. The device of claim 1, comprising a display to present the screen image.

8. A device to render two-dimensional (2D) imagery from three-dimensional (3D) model data comprising:

a shading component to shade a primitive visible within a shading image pixel of a shading image that corresponds to a screen image to determine a first color value of the shading image pixel;

a resolving component to assign the first color value to each screen image sample of a first set of screen image samples of a 3D model that falls within the shading image pixel; and

a sample averaging component to average color values of a second set of screen image samples of the 3D model that falls within a first screen image pixel of the screen image to determine a second color value of the first screen image pixel, the first screen image pixel at least partially coinciding with the shading image pixel, and the second set of screen image samples differing from and sharing at least one screen image sample with the first set of screen image samples.

9. The device of claim 8, comprising a fine rasterizing component to employ a multitude of screen image samples to rasterize the 3D model to identify a set of visible primitives of the 3D model that are visible from a perspective of the screen image and to generate a multitude of shading point identifiers (SPIDs) to correlate the multitude of screen image samples to a multitude of shading image pixels of the shading image, each SPID of the multitude of SPIDs associated with a screen image sample of the multitude of screen image samples that comprises the first and second sets of screen image samples, and each SPID to correlate a

visible primitive of the set of visible primitives to a shading image pixel of the multitude of shading image pixels.

10. The device of claim 9, each SPID of the multitude of SPIDs comprising:

an identifier assigned to a visible primitive of the set of visible primitives;

coordinates of a shading image pixel of the multitude shading image pixels in which the screen image sample associated with the SPID falls; and

an indication of a depth of the visible primitive within the shading image pixel associated with the coordinates.

11. The device of claim 10, comprising a shading constraint component to generate from the multitude of SPIDs a set of lists of visible primitives of the set of visible primitives, each list of the set of lists associated with a shading image pixel of the multitude of shading image pixels, and each list comprising at least one identifier of at least one visible primitive of the set of visible primitives that is visible within the shading image pixel associated with the list and an indication of a depth of the at least one visible primitive within the shading image pixel.

12. The device of claim 11, comprising a coarse shading component to employ a single shading image sample associated with a single shading image pixel of the multitude of shading image pixels to identify at least one primitive of the 3D model that exists along a path of the single shading image sample through the 3D model, the shading component to compare an identifier of the at least one primitive to the at least one identifier of a list of the set of lists associated with the single shading image pixel to determine whether to shade the at least one primitive in the single shading image pixel.

13. The device of claim 8, comprising an interface to transmit screen image data representing the screen image to another device.

14. A computer-implemented method for rendering two-dimensional (2D) imagery from three-dimensional (3D) model data comprising:

employing multiple screen image samples per screen image pixel of a screen image to perform fine rasterization of a 3D model to identify a set of visible primitives of the 3D model that are visible from a perspective of the screen image;

employing a single shading image sample per shading image pixel of a shading image that corresponds to the screen image to perform coarse rasterization of the 3D model from the perspective of the screen image to identify at least one primitive along a path of a shading image pixel; and

shading a primitive identified by a screen image sample of a first screen image pixel as visible within the shading image pixel and identified as along the path of the shading image sample associated with the shading image pixel to derive a first color value.

15. The computer-implemented method of claim 14, the method comprising:

assigning the first color value to each screen image sample of a first set of screen image samples of the 3D model that falls within the shading image pixel; and

averaging color values of a second set of screen image samples of the 3D model that falls within the first screen image pixel to determine a second color value of the first screen image pixel, the first screen image pixel at least partially coinciding with the shading image pixel, and the second set of screen image samples differing from and sharing at least one screen image sample with the first set of screen image samples.

16. The computer-implemented method of claim 14, the method comprising generating a multitude of shading point identifiers (SPIDs) to correlate a multitude of screen image samples comprising the first and second sets of screen image samples to a multitude of shading image pixels of the shading image, each SPID of the multitude of SPIDs associated with a screen image sample of a multitude of screen image samples, and each SPID to correlate a visible primitive of the set of visible primitives to a shading image pixel of the multitude of shading image pixels.

17. The computer-implemented method of claim 16, each SPID of the multitude of SPIDs comprising:

an identifier assigned to a visible primitive of the set of visible primitives;

coordinates of a shading image pixel of the multitude shading image pixels in which the screen image sample associated with the SPID falls; and

an indication of a depth of the visible primitive within the shading image pixel associated with the coordinates.

18. The computer-implemented method of claim 17, the method comprising generating from the multitude of SPIDs a set of lists of visible primitives of the set of visible primitives, each list of the set of lists associated with a shading image pixel of the multitude of shading image pixels, and each list comprising at least one identifier of at least one visible primitive of the set of visible primitives that is visible within the shading image pixel associated with the list and an indication of a depth of the at least one visible primitive within the shading image pixel.

19. The computer-implemented method of claim 15, the method comprising including a color value associated with a second screen image pixel adjacent the first screen image pixel in the screen image in determining the second color value to impart at least one of a motion blur effect or a depth-of-field effect to at least one object depicted in the screen image.

20. At least one machine-readable storage medium comprising instructions that when executed by a computing device, cause the computing device to:

employ multiple screen image samples per screen image pixel of a screen image to perform fine rasterization of a 3D model to identify a set of visible primitives of the 3D model that are visible from a perspective of the screen image;

employ a single shading image sample per shading image pixel of a shading image that corresponds to the screen image to perform coarse rasterization of the 3D model from the perspective of the screen image to identify at least one primitive along a path of a shading image pixel; and

shade a primitive identified by a screen image sample of a first screen image pixel as visible within the shading image pixel and identified as along the path of the shading image sample associated with the shading image pixel to derive a first color value.

21. The at least one machine-readable storage medium of claim 20, the computing device caused to generate a multitude of shading point identifiers (SPIDs) to correlate a multitude of screen image samples comprising the first and second sets of screen image samples to a multitude of shading image pixels of the shading image, each SPID of the multitude of SPIDs associated with a screen image sample of a multitude of screen image samples, and each SPID to correlate a visible primitive of the set of visible primitives to a shading image pixel of the multitude of shading image pixels.

22. The at least one machine-readable storage medium of claim 21, each SPID of the multitude of SPIDs comprising:

an identifier assigned to a visible primitive of the set of visible primitives;

coordinates of a shading image pixel of the multitude shading image pixels in which the screen image sample associated with the SPID falls; and

an indication of a depth of the visible primitive within the shading image pixel associated with the coordinates.

23. The at least one machine-readable storage medium of claim 22, the computing device caused to redistribute identifiers among at least a subset of the SPIDs of the multitude of SPIDs to impart at least one of a motion blur effect or a depth-of-field effect.

24. The at least one machine-readable storage medium of claim 22, the computing device caused to generate from the multitude of SPIDs a set of lists of visible primitives of the set of visible primitives, each list of the set of lists associated with a shading image pixel of the multitude of shading image pixels, and each list comprising at least one identifier of at least one visible primitive of the set of visible primitives that is visible within the shading image pixel associated with the list and an indication of a depth of the at least one visible primitive within the shading image pixel.

25. The at least one machine-readable storage medium of claim 24, the computing device caused to compare an identifier of the at least one primitive to the at least one identifier of a list of the set of lists associated with a single shading image pixel to determine whether to shade the at least one primitive in the single shading image pixel.