Graphics & Visualization
Principles and Algorithms

Errata

Last update: 27 December 2016

Each erratum is marked with a number corresponding to the date it was reported, as follows:

1 – 25 Jan 2009
2 – 16 Feb 2009
3 – 13 May 2009
4 – 11 Sep 2009
5 – 20 Jan 2010
6 – 20 Sep 2010
7 – 30 May 2011
8 – 24 June 2011
9 – 29 Apr 2013
10 – 16 Jun 2016
11 – 27 Dec 2016

Errors are given in red, corrections in green.

1 page xi. Remove the last 2 lines of the page (they are repeated on the next page).

1 page xiii. In the bullet point referring to Chapter 17, change page 622 to page 620.

5 page 17. In the paragraph on double buffering, second line, reverse random/sequential to sequential/random (so that they correspond to reading and writing of the frame buffer memory).

4 page 17. In the paragraph on double buffering, change the end of the first sentence from generated. to generated, thus displaying an incomplete frame (this is called tearing). (Suggestion by Sugih Jamin)

4 page 18. Change to second sentence of the page from In this case . . . differences. to Tearing is still possible if the sequential reading of the front buffer has not completed a whole frame and the contents of the two buffers have significant differences. (Suggestion by Sugih Jamin)

5 page 34. In algorithm line3, the third line, e=-(dx >> 1);, must be moved after the lines assigning dx and dy.

1 page 42. In the first paragraph, line 8, change rasterized to not rasterized; conversely in line 9, change not rasterized to rasterized. Also correct the spelling of vertices (in lines 8-9) to vertices.

5 page 43. Lines 6-7: change the minimum x to the x-coordinate of the intersection of the scanline with the edge. Also in Figure 2.15, change the label x_{min} to x.

8 page 99 In the second line from the bottom of the page, add the explanatory text (since the angle \( \theta_2 \) is negative).

Moreover, in the next equation correct \( \sin \theta_2 = -\frac{a}{\sqrt{a^2+b^2+c^2}} \) (adding the negative sign).

Finally, in the matrix that follows, correct the signs corresponding to \( \sin \theta_2 \):

\[
R_y(\theta_2) = \begin{bmatrix}
\frac{\sqrt{b^2+c^2}}{\sqrt{a^2+b^2+c^2}} & 0 & -\frac{a}{\sqrt{a^2+b^2+c^2}} & 0 \\
0 & 1 & 0 & 0 \\
\frac{a}{\sqrt{a^2+b^2+c^2}} & 0 & \frac{\sqrt{b^2+c^2}}{\sqrt{a^2+b^2+c^2}} & 0 \\
0 & 0 & 0 & 1
\end{bmatrix}
\]

5 page 133. In the last paragraph, first line, change \( P_{PER} \) to \( P_{PER} \). (Reported by Sugih Jamin)
In the caption of Figure 5.5, replace stab by stub.

Three lines before the end of the text, replace stab by stub.

Second paragraph, lines 2–3: rephrase it is easily reversible to the coarse base model by performing vertex splits (Figure 6.9) to it is easily reversible by performing vertex splits (Figure 6.9) to the coarse base model.

In the second line of paragraph 7.2.3, replace inefficient by unstable.

At the end of equation (7.32b) replace the index $i$ by $j$ so that the last line reads $j = i - k + 1, \ldots$.

Three lines after equation (7.66) change curve to surface.

Second paragraph, line 7: change curve to surface.

In exercise 4, at the start of the second line add the word multiple so that the sentence becomes . . . to insert the same knot $s$ multiple times . . . .

In the last line before section 8.3, replace $(m_i \times n_j)$ with $(m_i \cdot n_j)$.

In the last line before section 8.3.1, replace subscript with superscript.

Last paragraph of the page, first line: replace recursively with iteratively.

In the caption of Figure 8.2, first line: correct mask to masks.

Right below equation (8.7) change $P_{i+1}$ to $P_{j+1}$ for consistency.

In item 4. of the enumeration, change $P_{i+1}$ to $P_{j+1}$ and $P_i$ to $P_j$ (twice, in (a) and (b) below) for consistency.

In equation (8.14) change $\alpha$ to $\alpha_n$ (four times).

In equation (8.15) change $v_{e_{i+1}}$ to $v_{e_{j+1}}$. Also change the index $i$ to $k$ inside the summation so that it becomes $\sum_{k=1}^{n} \alpha_k c_k$.

In equation (8.16) change the index $i$ with $k$ everywhere.

In the last line change the index $i$ with $k$ for the vertices $c_i$ of the ring, which become $(c_k)_{0 \leq k \leq n-1}$.

In the caption of Figure 8.2, first line: correct mask to masks.

In equation (8.17) change $v_{e_{i+1}}$ to $v_{e_{j+1}}$. Also change the index $i$ to $k$ inside the summation so that it becomes $\sum_{k=1}^{n} \alpha_k c_k$.

Right below equation (8.17), change valency to valence (for consistency of terminology).

In equation (8.18) change $v_{e_{i+1}}$ to $v_{e_{j+1}}$. Also change the index $i$ to $k$ inside the summation so that it becomes $\sum_{k=0}^{n-1} \alpha_k c_k$.

Right below equation (8.17) change $i$ to $k$ so that $\alpha_i$ becomes $\alpha_k$. Also correct the first formula to $\alpha_k = \frac{1}{3} \left( \frac{1}{4} + \cos \frac{2\pi k}{n} + \frac{1}{2} \cos \frac{4\pi k}{n} \right)$.

In equation (8.19) and above change the index $i$ to $r$ for consistency, so that $\alpha_i$ becomes $\alpha_r$ and (8.19) becomes $\alpha_r = 2 \sum_{j=0}^{n-1} 2^{-j} \cos \frac{2\pi r j}{n}$.

In steps 2(a) and 2(b) of the $\sqrt{3}$ scheme, change index $i$ in the notation of the ring vertices to $k$, so that $b_i$ becomes $b_k$ in step (a) and in equation (8.20) (where the summation index should also be changed from $i$ to $k$).

In Item 1 near the bottom of the page change “It is an interpolating scheme.” to “It is not an interpolating scheme.”
In the second paragraph of Section 8.5, two lines before the end, change whereas the butterfly and √3 schemes are interpolating to whereas the butterfly scheme is an interpolating one.

In lines 4 and 5 from the top (not counting the equations) replace m × n with m · n (twice).

At the end of line 2, add a closing parenthesis after (c_i): to get (c_i)).

Second paragraph, four lines before the end, replace ϕ_i with ϕ_i.

At the end of line 2, add a closing parenthesis after (c_i): to get (c_i):.

Second paragraph, four lines before the end, replace ϕ_i with ϕ_i.

In third line of the last paragraph before Section 8.6.2, and in the equation beneath, replace \( \hat{A}^k \) with \( \hat{A}_k \) (twice).

Change the last , of page 281 to . and delete the first sentence of page 282 (where . . . eigenvalue).

In the paragraph before equation (8.33), rephrase . . . from the constrained minimization problem. Minimize \( \Pi_a \) subject to \( C_a u_x = g_a \), whose solution is obtained as with . . . from the constrained minimization problem: minimize \( \Pi_a \) subject to \( C_a u_x = g_a \). Its solution is obtained as.

In Figure 12.5, the angles \( \phi_r \) and \( \phi_i \) should be marked as \( \phi_r \) and \( \phi_i \) for consistency with the text. (Reported by Sugih Jamin)

In Figure 12.11, the angle \( \phi \) should be marked as \( \varphi \) for consistency with the text. (Reported by Sugih Jamin)

In Figure 12.11, the angle \( \phi \) should be marked as \( \varphi \) for consistency with the text. (Reported by Sugih Jamin)

Starting from the end of line 4 of 12.6, change the sentence In 1971 Gouraud . . . at the vertices [Gour71] to Warnock, Romney and Watkins suggested the interpolation of intensity values within polygons from intensity values computed at the vertices. In 1971 Gouraud [Gour71] integrated their works and suggested the computation of unique vertex normals on shared polygon vertices.

Last line before the final paragraph: correct spelling of repectively to respectively.

In equation (14.6) change \( p_2 \) to \( p_2 \) on the first line and \( p_3 \) to \( p_3 \) on the second line (that is, change italics to bold so that they are marked as points).

In the 10th line of Section 14.5.1, replace pseudo-number with pseudo-random number. (Reported by Sugih Jamin)

In the 8th line of the code at the top of the page replace prim->isect(r) with prim->isect(shadowRay). (Reported by Sugih Jamin)

Replace the last sentence of the second paragraph, Bidirectional ray tracing was developed ... and Veach [Veac94]. with Bidirectional ray-tracing was proposed by Arvo [Arvo86] and then developed, among others, by Heckbert [Heck90], Lafortune and Willems [Lafo94], and Veach and Guibas [Veac94]. See below for the two new references [Arvo86] and [Heck90]. (Reported by Sugih Jamin)

The commands of the inner loop in the algorithm at the top of the page become:

```c
frame_buffer(x+a,y+b)=
  frame_buffer(x+a,y+b)+
  voxel(x,y,s)*footprint(a,b)*
  (1-transparency_buffer(x+a,y+b))
transparency_buffer(x+a,y+b)=
  min(1,transparency_buffer(x+a,y+b)+
  transp(voxel(x,y,s))
  *footprint(a,b))
```
4 page 668. Change the last part of the first line and the start of the second line from ; they are also to and.

1 page 676. In the middle of the page, change $\lambda[a_x, a_y, a_z]$ to $\lambda[a_x, a_y, a_z]^T$ (add the transpose mark).

1 page 678. In the fifth line of text, change vector $[5, 1, 2]$ to $[5, 1, 2]^T$ (add the transpose mark).
