

Parallel BVH Construction for Real-Time Ray Tracing

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Ray Traced Scene

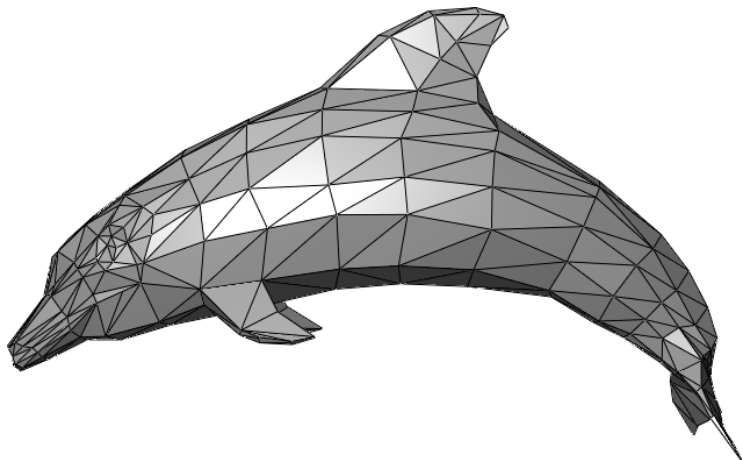


[https://en.wikipedia.org/wiki/Ray_tracing_\(graphics\)](https://en.wikipedia.org/wiki/Ray_tracing_(graphics))

Outline

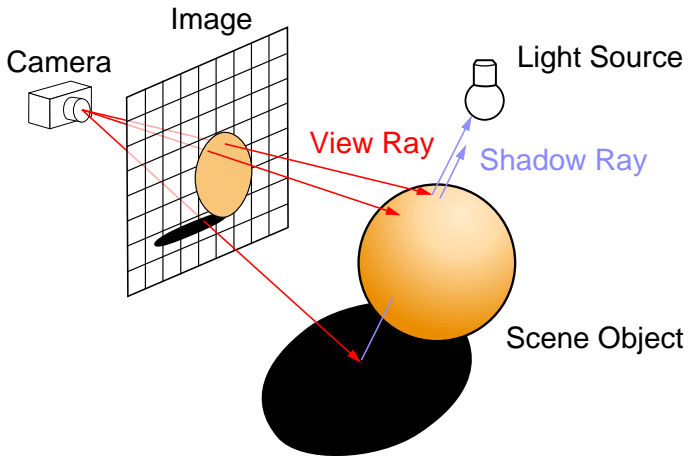
- 1 Background
- 2 Main Content
- 3 Results

Primitives



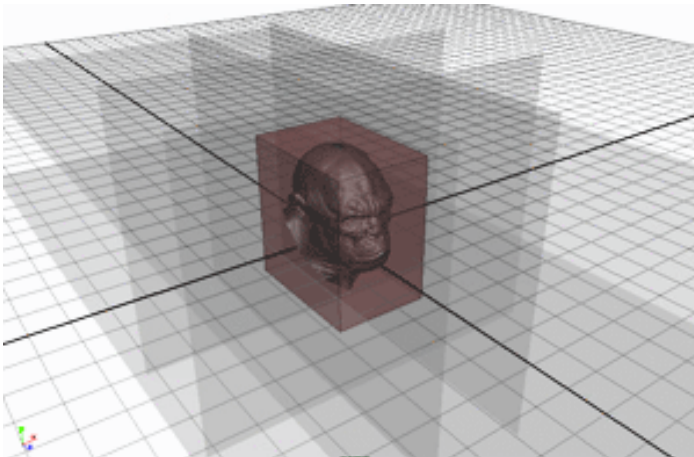
https://en.wikipedia.org/wiki/Triangle_mesh

Ray Tracing



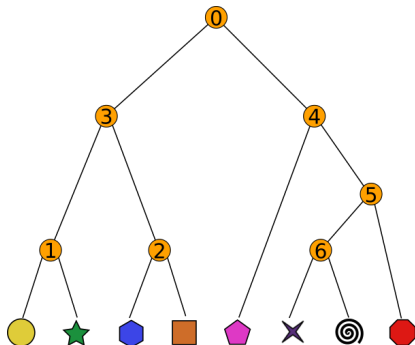
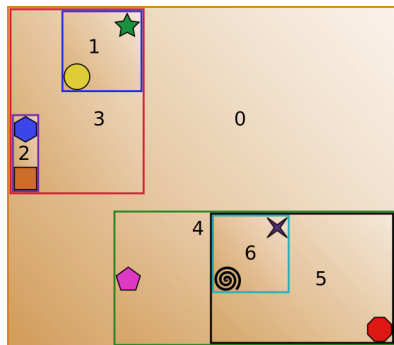
[https://en.wikipedia.org/wiki/Ray_tracing_\(graphics\)](https://en.wikipedia.org/wiki/Ray_tracing_(graphics))

Axis-Aligned Bounding Boxes

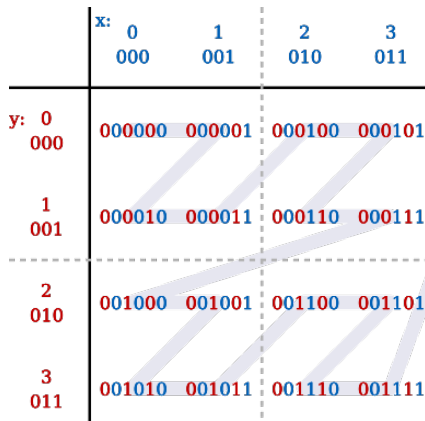
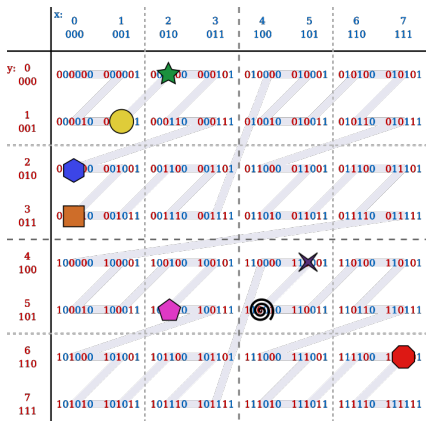


<http://www.scratchapixel.com>

Grouped Primitives



Morton Codes



Morton Codes

	x:	0	1	2	3	4	5	6	7
		000	001	010	011	100	101	110	111
y: 0	000	000000	000001	000100	000101	010000	010001	010100	010101
1	001	000010	000011	000110	000111	010010	010011	010110	010111
2	010	001000	001001	001100	001101	011000	011001	011100	011101
3	011	001010	001011	001110	001111	011010	011011	011110	011111
4	100	100000	100001	100100	100101	110000	110001	110100	110101
5	101	100010	100011	100110	100111	110010	110011	110110	110111
6	110	101000	101001	101100	101101	111000	111001	111100	111101
7	111	101010	101011	101110	101111	111010	111011	111110	111111

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1	001	000010	000011	000110	000111	010010	010011	010110	010111
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3	011	000110	000111	000110	000111	010110	010111	010110	010111
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5	101	100010	100011	100110	100111	110010	110011	110110	110111
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Morton Codes

	x: 0 000	1 001	2 010	3 011	4 100	5 101	6 110	7 111
y: 0 000	000000 000001	010000 000101	010000 010001	010100 010101				
1 001	000010 000111	010010 010011	010110 010111					
2 010	000100 001001	001100 001101	011000 011001	011100 011101				
3 011	000110 001011	001110 001111	011010 011011	011110 011111				
4 100	100000 100001	100100 100101	110000 110001	110100 110101				
5 101	100010 100011	100110 100111	110010 110011	110110 110111				
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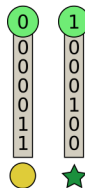
Morton Codes

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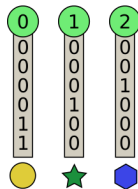
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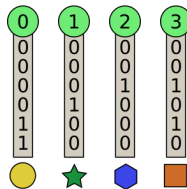
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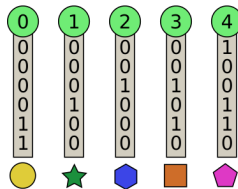
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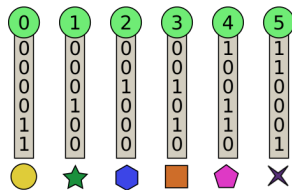
Morton Codes

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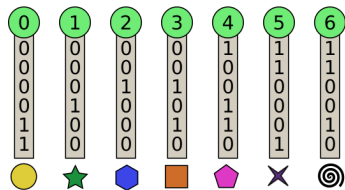
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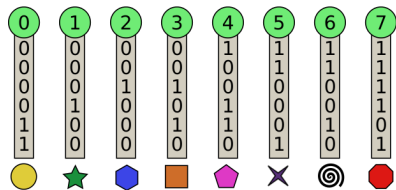
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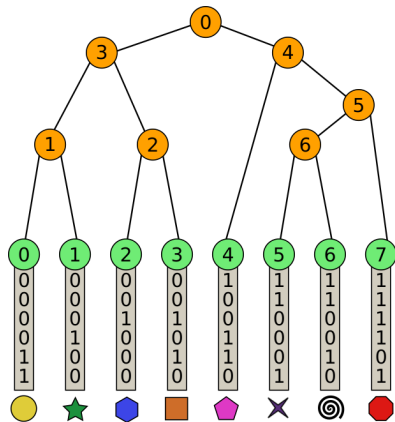
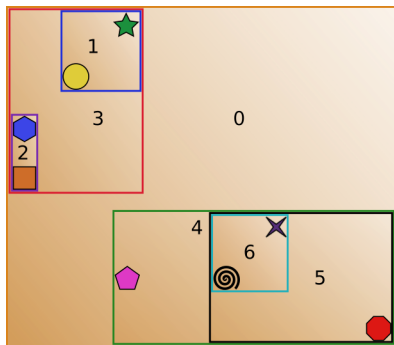


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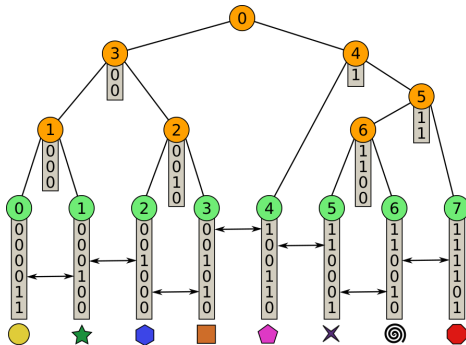
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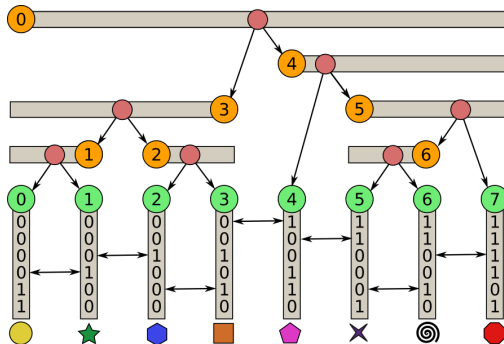
Morton Codes



Binary Radix Tree



Internal Node Array



Discussion

Questions?