

# Parallel BVH Construction for Real-Time Ray Tracing

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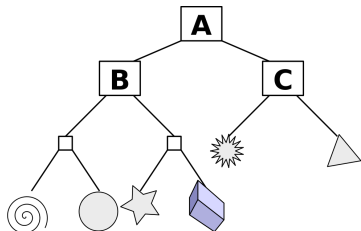
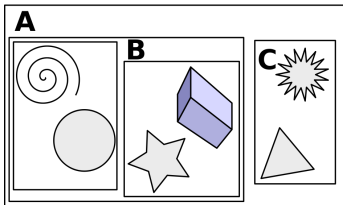
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# Outline

- 1 Bounding Volume Hierarchies
- 2 Z-order Curves
- 3 Binary Radix Trees

# BVH Example

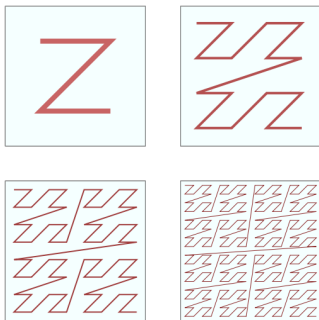


# Morton Codes

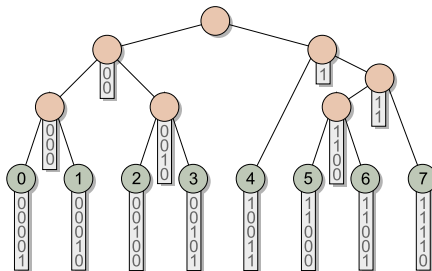
- Interleave binary representations of coordinate values
- Transforms multidimensional coordinates into a single value
- Morton Code contains location information
- Used to sort objects

	x: 0 000	1 001	2 010	3 011	4 100	5 101	6 110	7 111
y: 0 000	00000000	00000100	00001000	00001100	01000000	01000100	01001000	01001100
1 001	00001000	00001100	00010000	00010100	01001000	01001100	01010000	01010100
2 010	00100000	00100100	00110000	00110100	01100000	01100100	01110000	01110100
3 011	00101000	00101100	00111000	00111100	01101000	01101100	01111000	01111100
4 100	10000000	10000100	10010000	10010100	11000000	11000100	11010000	11010100
5 101	10001000	10001100	10011000	10011100	11001000	11001100	11011000	11011100
6 110	10100000	10100100	10110000	10110100	11100000	11100100	11110000	11110100
7 111	10101000	10101100	10111000	10111100	11101000	11101100	11111000	11111100

# Shape of a Z-order Curve



# Binary Radix Tree Example



	0 000	1 001	2 010	3 011	4 100	5 101	6 110	7 111
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

# Discussion

Questions?