Supplemental Material for the paper "Parallel Irradiance Caching for Interactive Monte-Carlo Direct Volume Rendering"

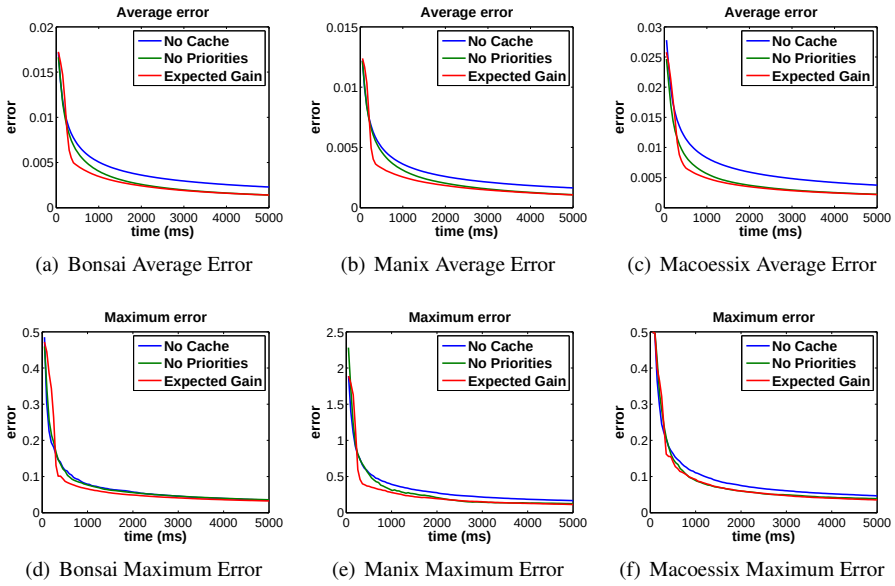
Philip Voglreiter[1], Markus Steinberger[1], Rostislav Khlebnikov[1], Bernhard Kainz[2], and Dieter Schmalstieg[1]

[1]Institute for Computer Graphics and Vision, Graz University of Technology
[2]Department of Computing, Imperial College London

Measurements

The following figures describe our extensive experiments and recorded quantities.

List of Figures



(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 1: Testrun 1: Static Scene, Convergence for full scale volumes at 1280x720, light situation 1.

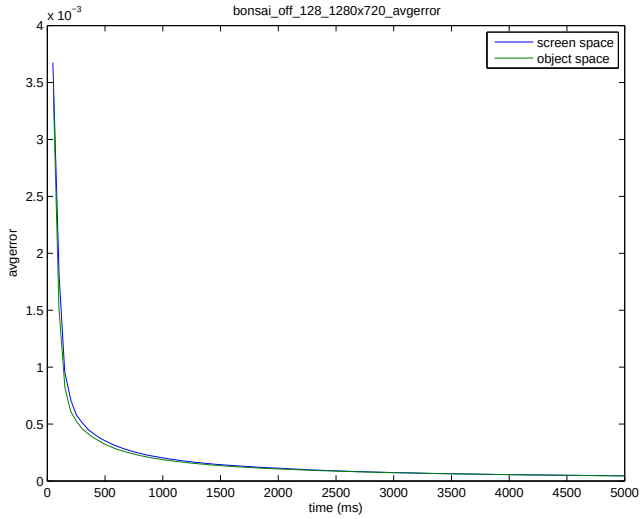
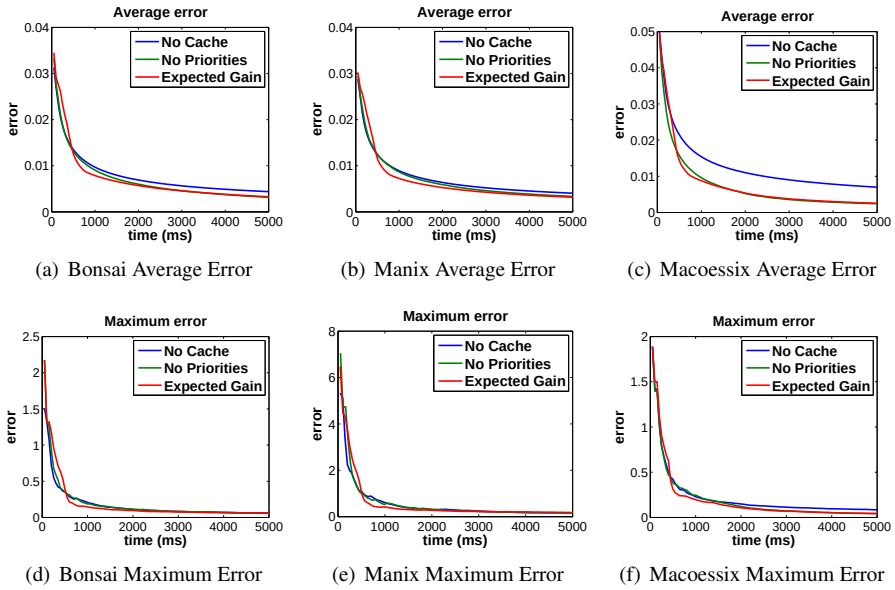


Figure 12: screen space vs object space: average error bonsai, background off, volume res = 128, screen res = 1280x720, average error



(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 2: Testrun 1: Static Scene, Convergence for full scale volumes at 1280x720, light situation 2.

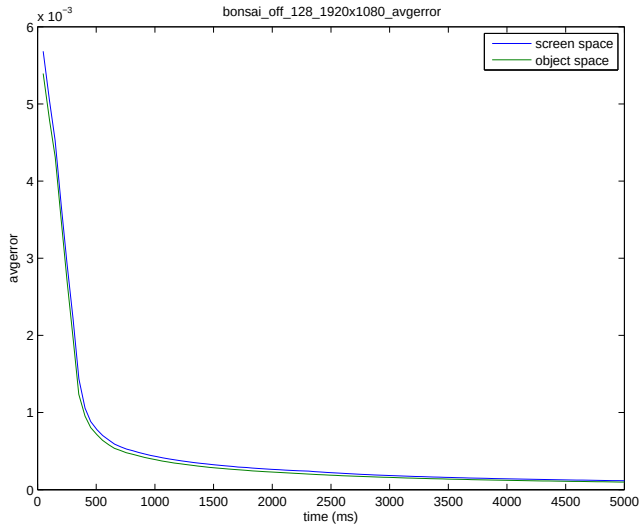
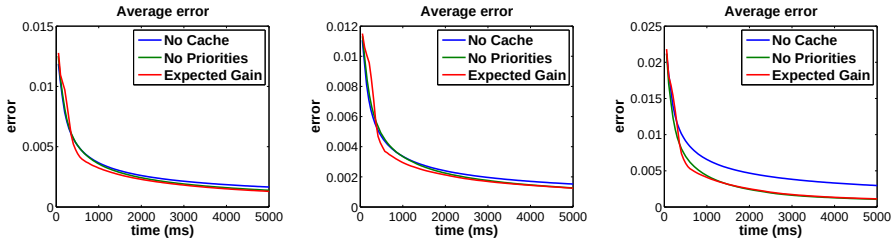
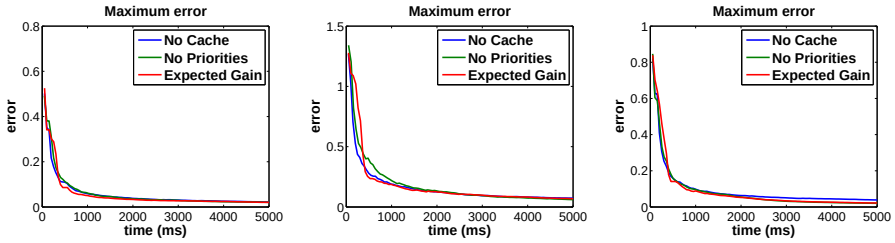


Figure 13: screen space vs object space: average error bonsai, background off, volume res = 128, screen res = 1920x1080, average error

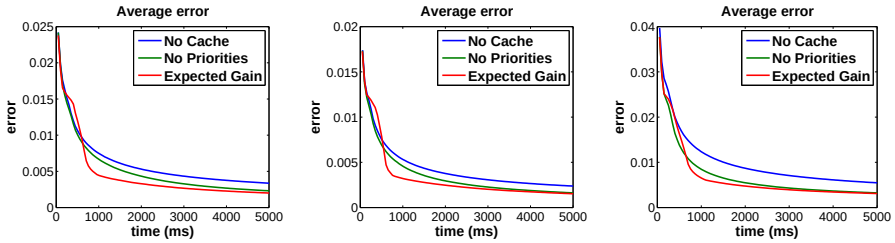


(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

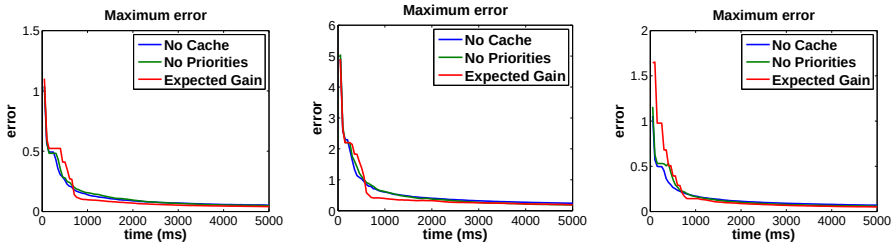


(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 3: Testrun 1: Static Scene, Convergence for full scale volumes at 1280x720, light situation 3.

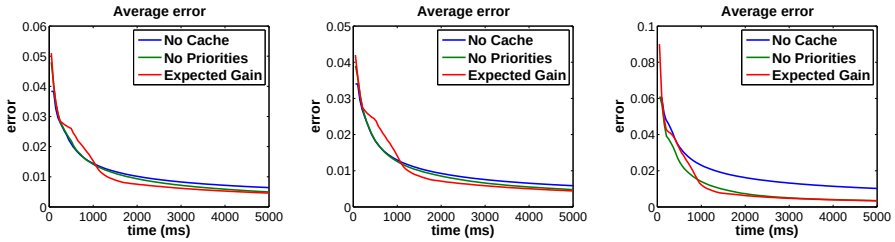


(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

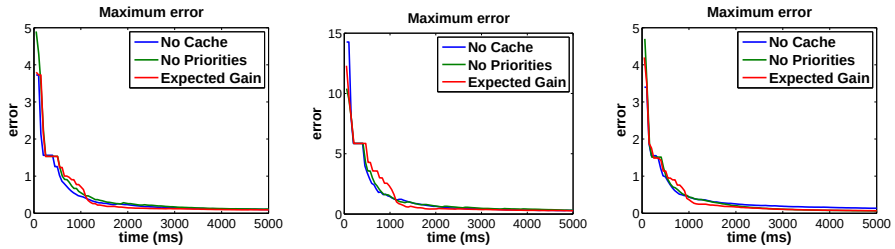


(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 4: Testrun 2: Static Scene, Convergence for full scale volumes at 1920x1080, light situation 1.

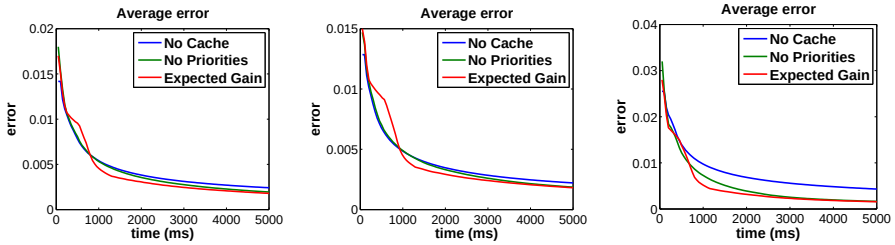


(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

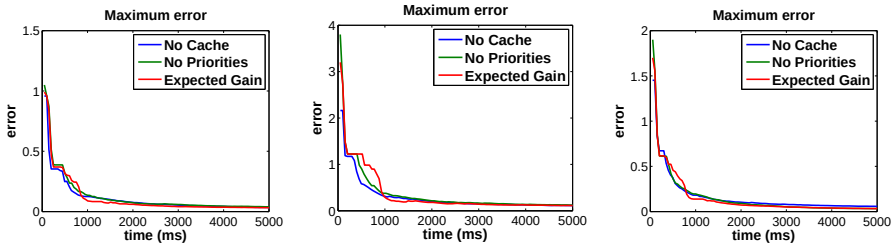


(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 5: Testrun 2: Static Scene, Convergence for full scale volumes at 1920x1080, light situation 2.

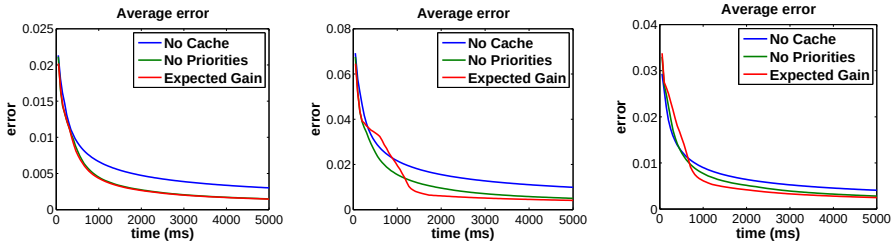


(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

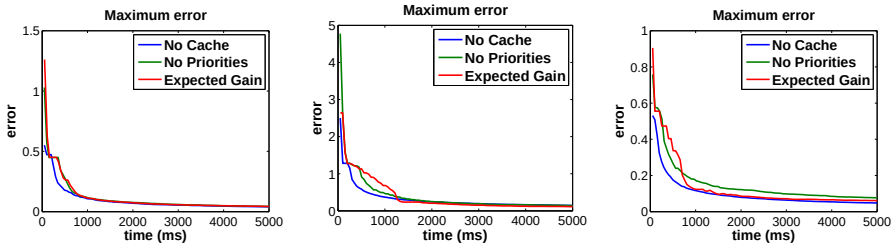


(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 6: Testrun 2: Static Scene, Convergence for full scale volumes at 1920x1080, light situation 3.

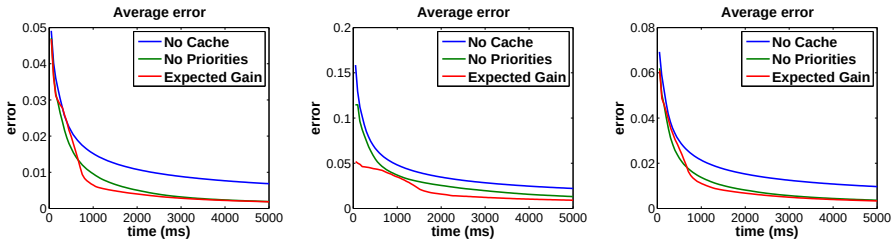


(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

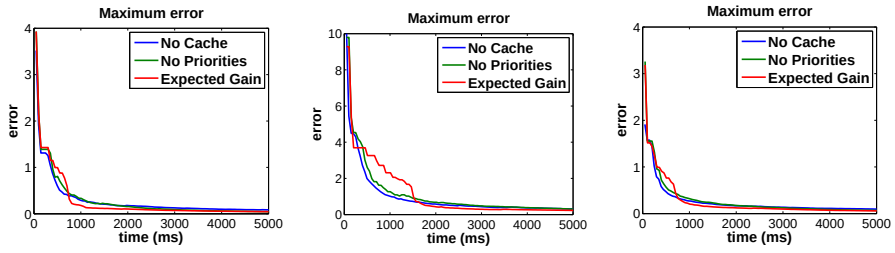


(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 7: Testrun 3: Static Scene, Convergence for half scale volumes at 1920x1080, light situation 1.

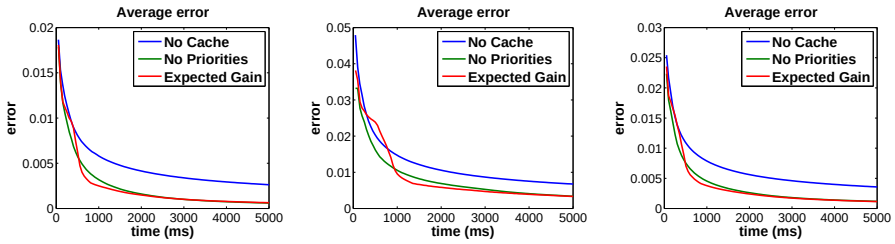


(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

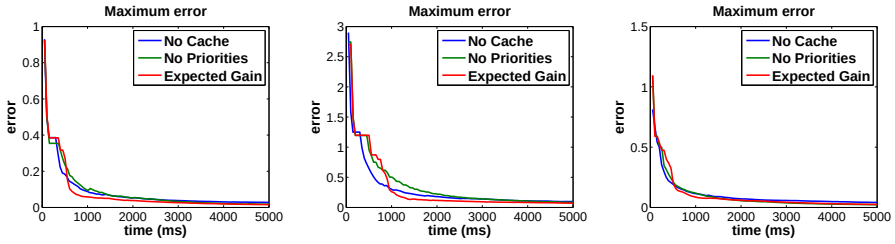


(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 8: Testrun 3: Static Scene, Convergence for half scale volumes at 1920x1080, light situation 2.

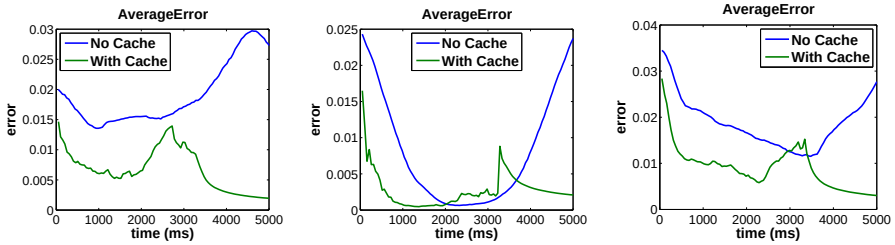


(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error

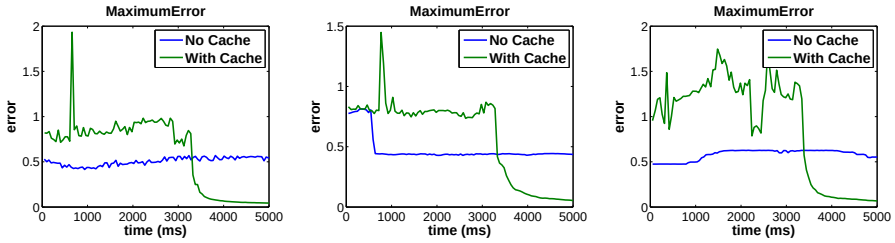


(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 9: Testrun 3: Static Scene, Convergence for half scale volumes at 1920x1080, light situation 3.

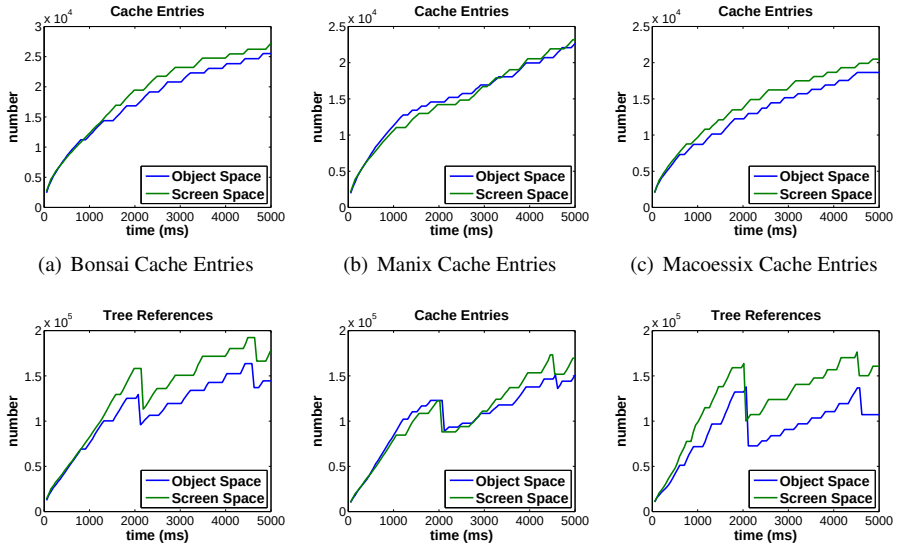


(a) Bonsai Average Error (b) Manix Average Error (c) Macoessix Average Error



(d) Bonsai Maximum Error (e) Manix Maximum Error (f) Macoessix Maximum Error

Figure 10: Testrun 4: Rotating Scene, Convergence for half scale volumes at 1920x1080, light situation 1.



(a) Bonsai Cache Entries (b) Manix Cache Entries (c) Macoessix Cache Entries

(d) Bonsai Tree References (e) Manix Tree References (f) Macoessix Tree References

Figure 11: Testrun 5: Rotating Scene, Behaviour of cache entry count & reference count.

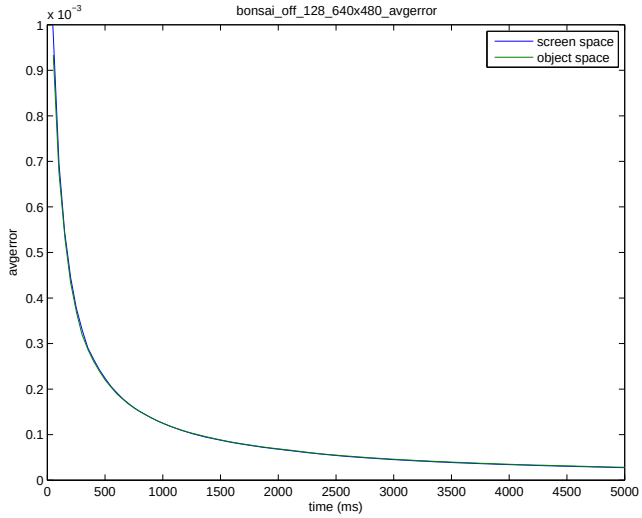


Figure 14: screen space vs object space: average error bonsai, background off, volume res = 128, screen res = 640x480, average error

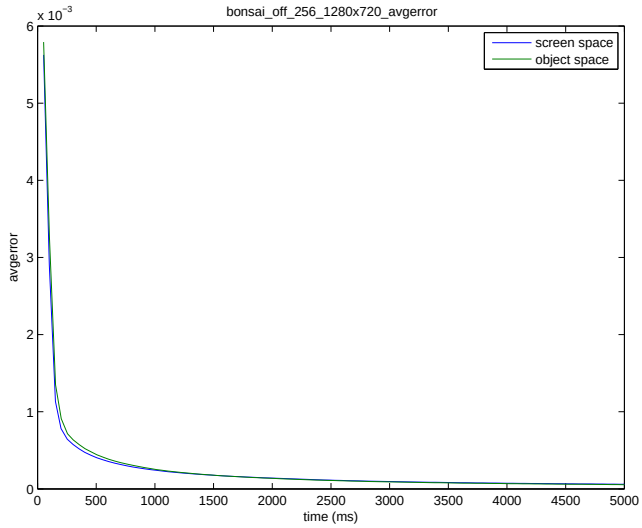


Figure 15: screen space vs object space: average error bonsai, background off, volume res = 256, screen res = 1280x720, average error

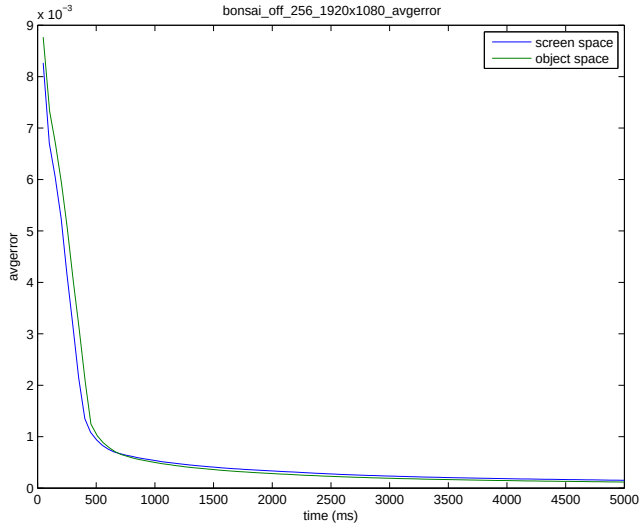


Figure 16: screen space vs object space: average error bonsai, background off, volume res = 256, screen res = 1920x1080, average error

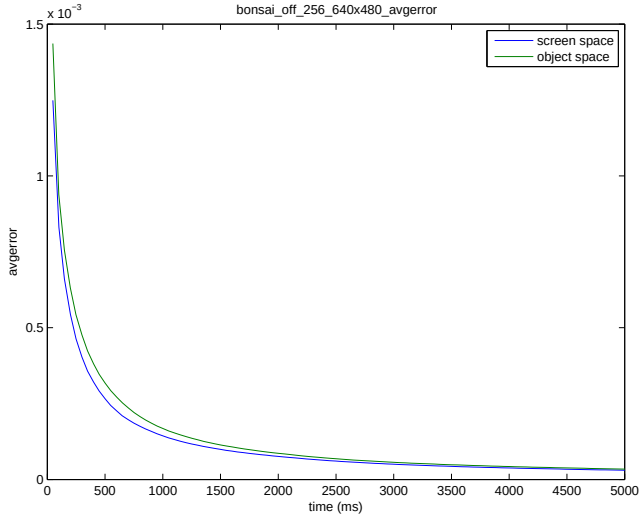


Figure 17: screen space vs object space: average error bonsai, background off, volume res = 256, screen res = 640x480, average error

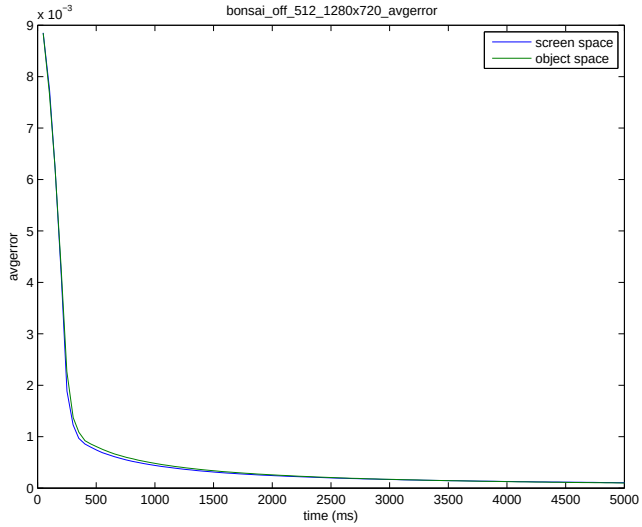


Figure 18: screen space vs object space: average error bonsai, background off, volume res = 512, screen res = 1280x720, average error

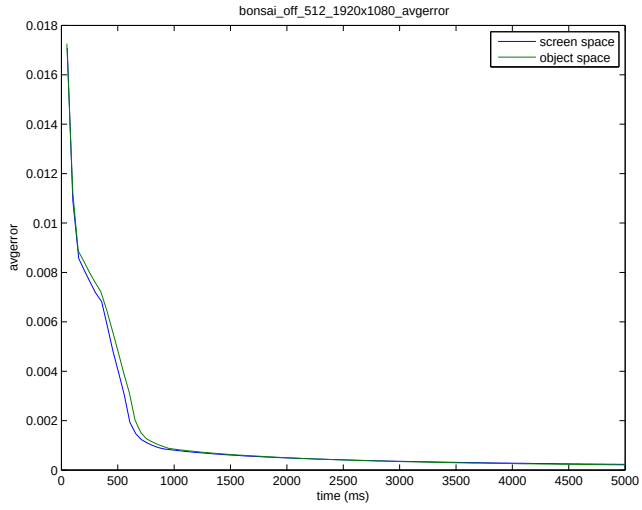


Figure 19: screen space vs object space: average error bonsai, background off, volume res = 512, screen res = 1920x1080, average error

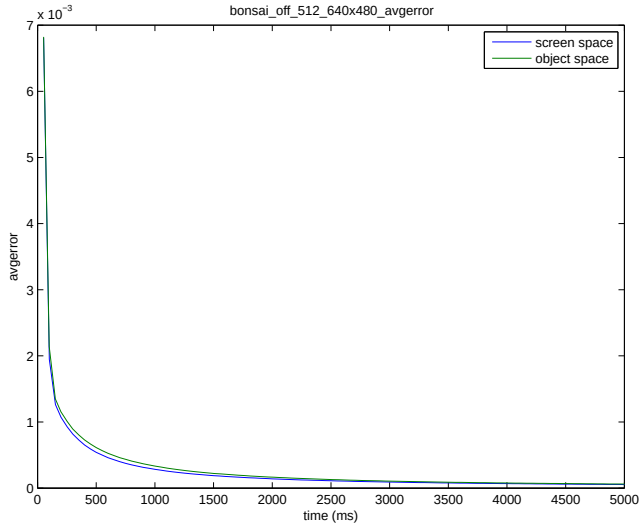


Figure 20: screen space vs object space: average error bonsai, background off, volume res = 512, screen res = 640x480, average error

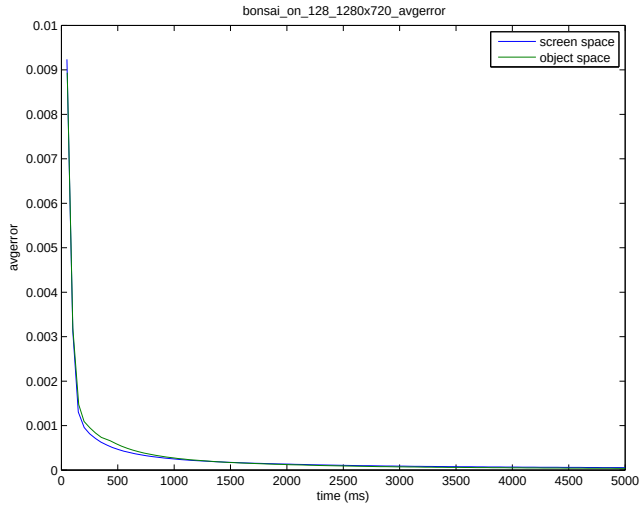


Figure 21: screen space vs object space: average error bonsai, background on, volume res = 128, screen res = 1280x720, average error

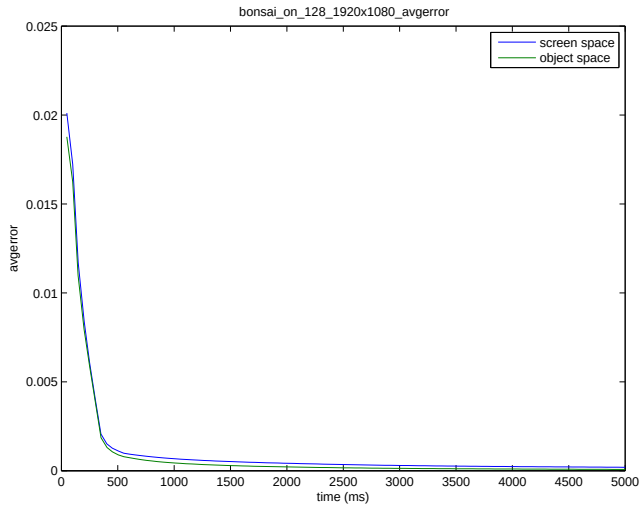


Figure 22: screen space vs object space: average error bonsai, background on, volume res = 128, screen res = 1920x1080, average error

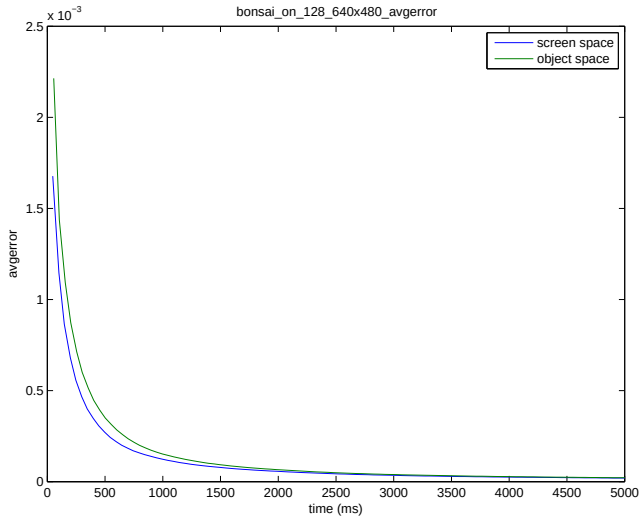


Figure 23: screen space vs object space: average error bonsai, background on, volume res = 128, screen res = 640x480, average error

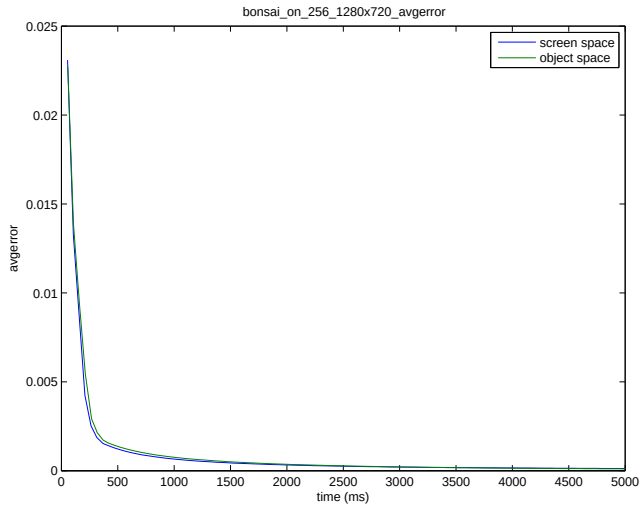


Figure 24: screen space vs object space: average error bonsai, background on, volume res = 256, screen res = 1280x720, average error

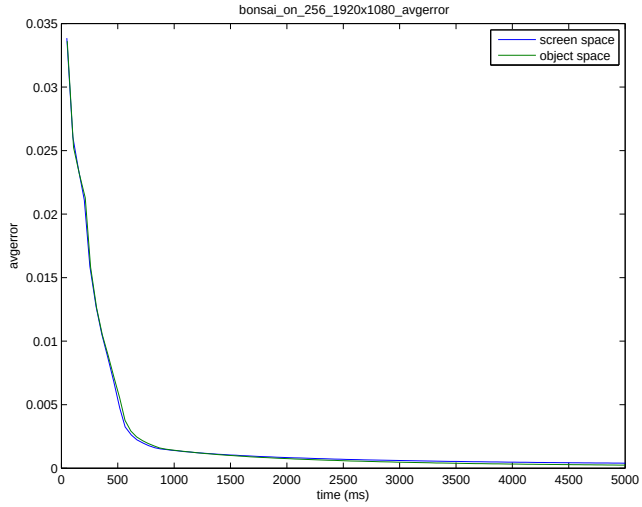


Figure 25: screen space vs object space: average error bonsai, background on, volume res = 256, screen res = 1920x1080, average error

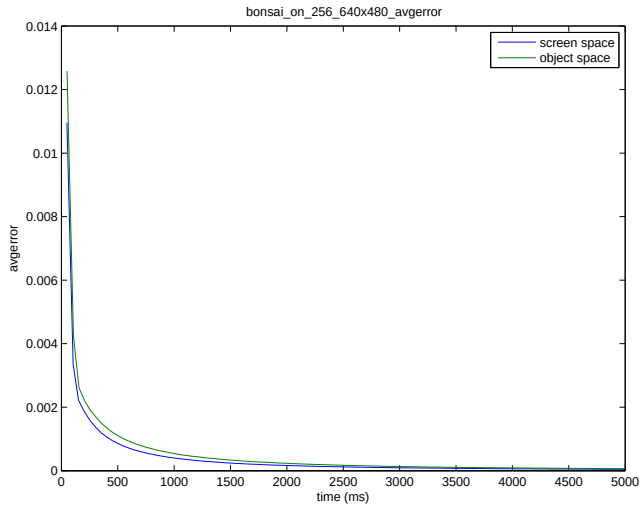


Figure 26: screen space vs object space: average error bonsai, background on, volume res = 256, screen res = 640x480, average error

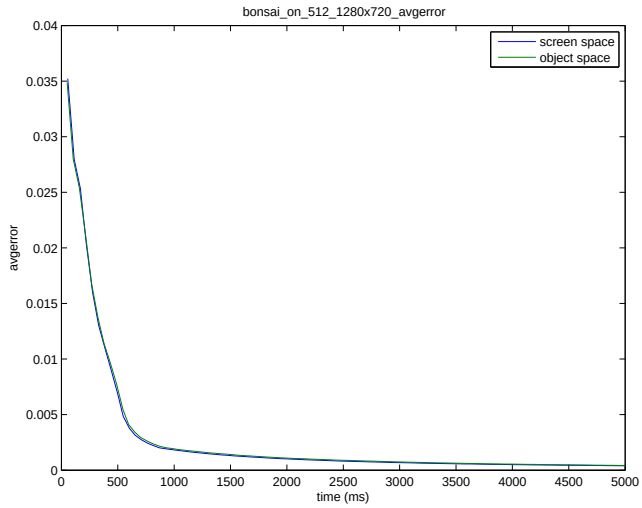


Figure 27: screen space vs object space: average error bonsai, background on, volume res = 512, screen res = 1280x720, average error

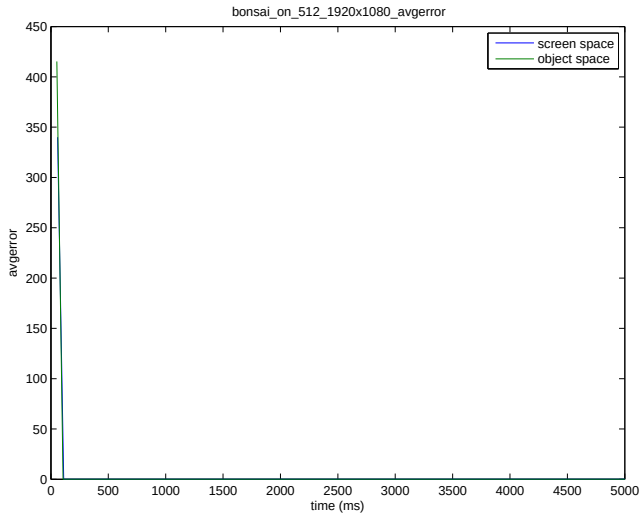


Figure 28: screen space vs object space: average error bonsai, background on, volume res = 512, screen res = 1920x1080, average error

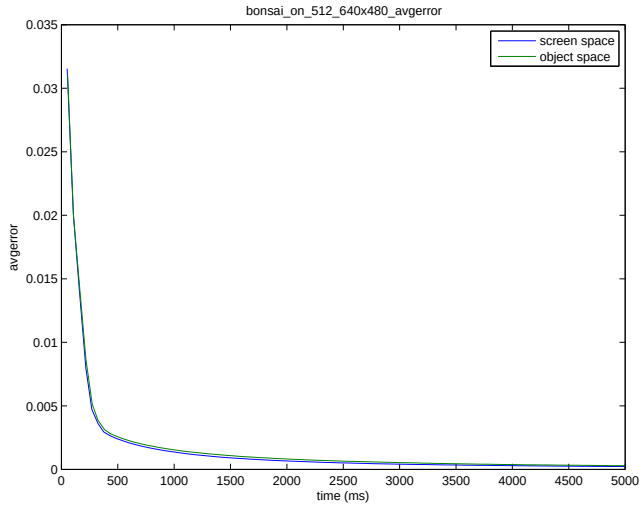


Figure 29: screen space vs object space: average error bonsai, background on, volume res = 512, screen res = 640x480, average error

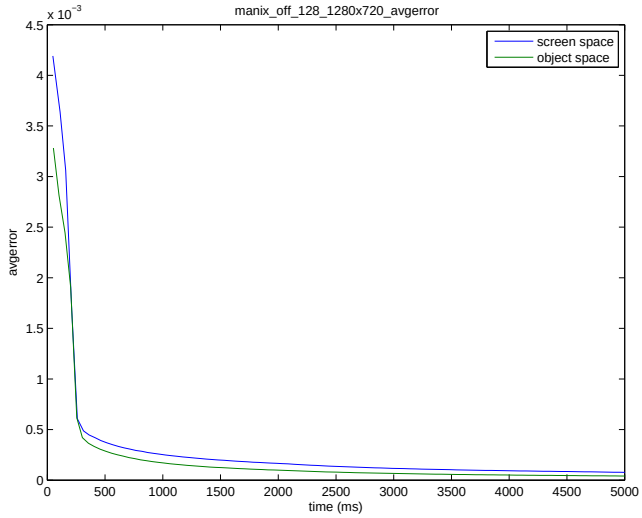


Figure 30: screen space vs object space: average error manix, background off, volume res = 128, screen res = 1280x720, average error

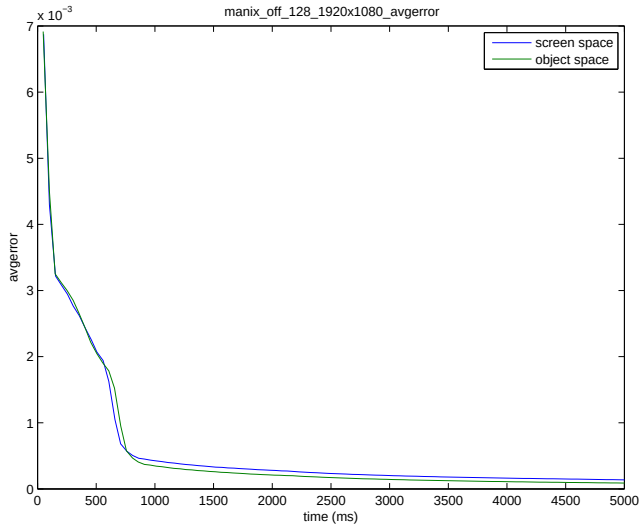


Figure 31: screen space vs object space: average error manix, background off, volume res = 128, screen res = 1920x1080, average error

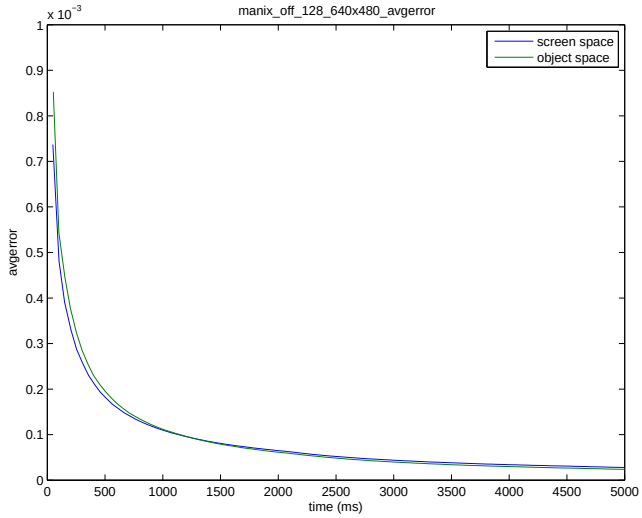


Figure 32: screen space vs object space: average error manix, background off, volume res = 128, screen res = 640x480, average error

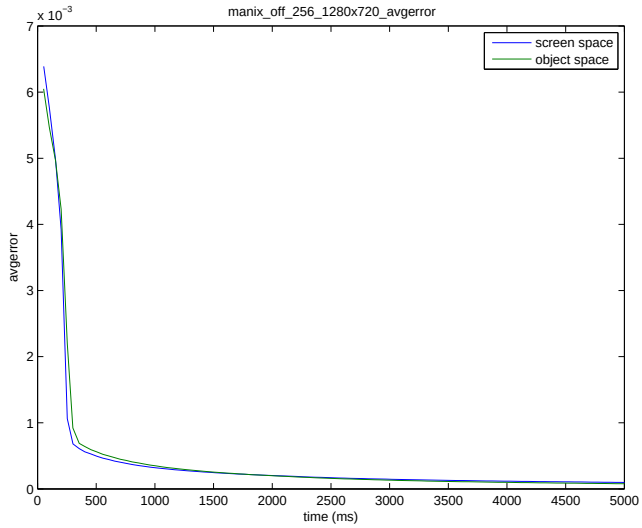


Figure 33: screen space vs object space: average error manix, background off, volume res = 256, screen res = 1280x720, average error

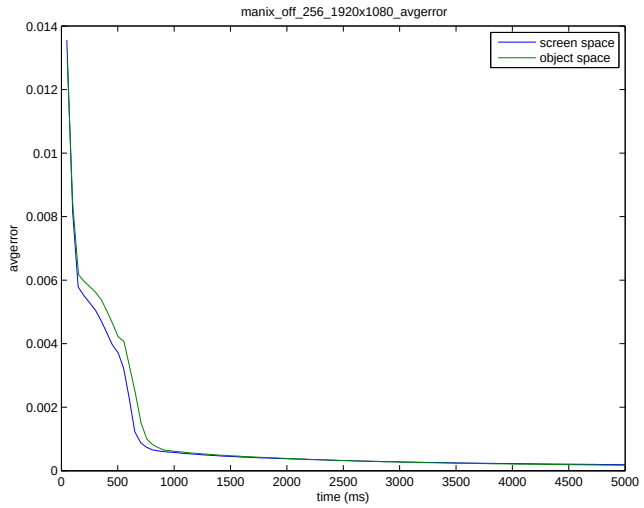


Figure 34: screen space vs object space: average error manix, background off, volume res = 256, screen res = 1920x1080, average error

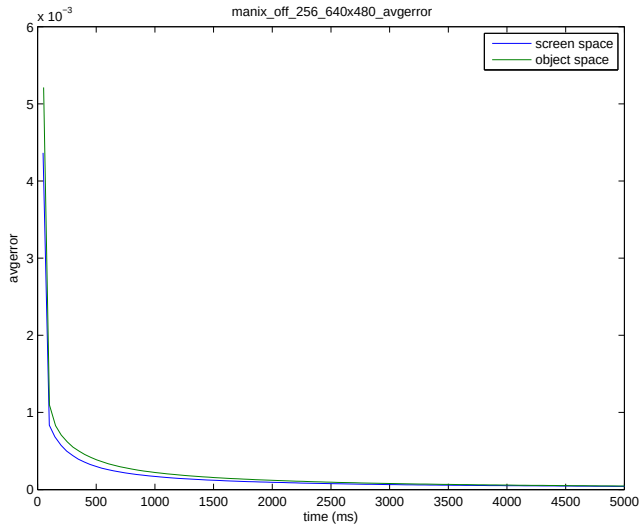


Figure 35: screen space vs object space: average error manix, background off, volume res = 256, screen res = 640x480, average error

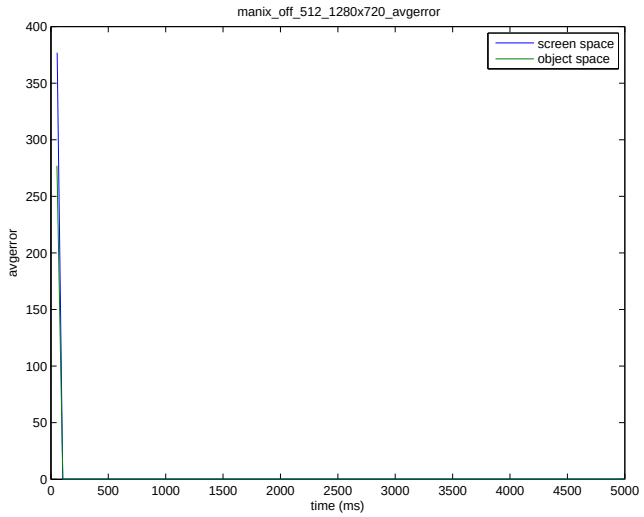


Figure 36: screen space vs object space: average error manix, background off, volume res = 512, screen res = 1280x720, average error

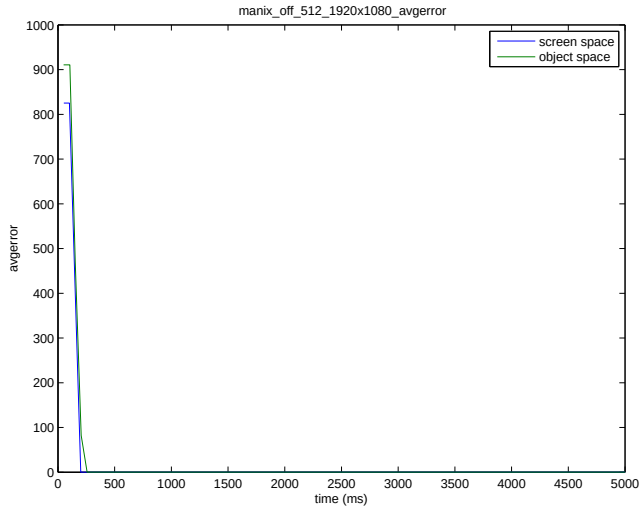


Figure 37: screen space vs object space: average error manix, background off, volume res = 512, screen res = 1920x1080, average error

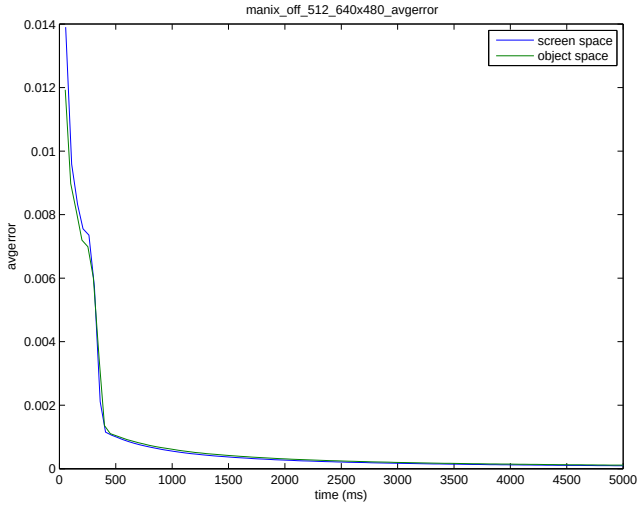


Figure 38: screen space vs object space: average error manix, background off, volume res = 512, screen res = 640x480, average error

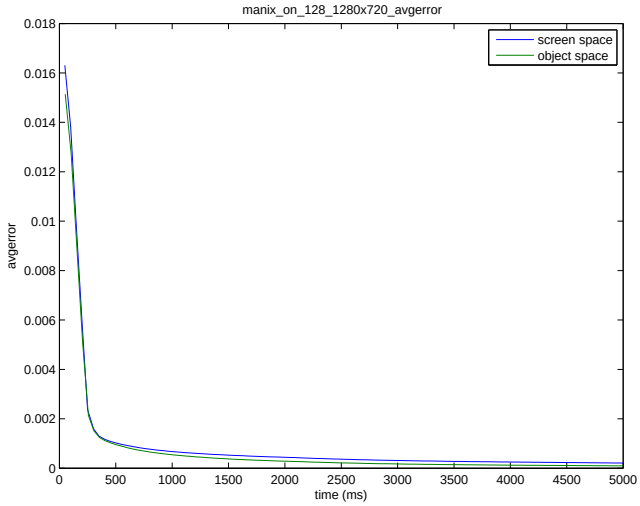


Figure 39: screen space vs object space: average error manix, background on, volume res = 128, screen res = 1280x720, average error

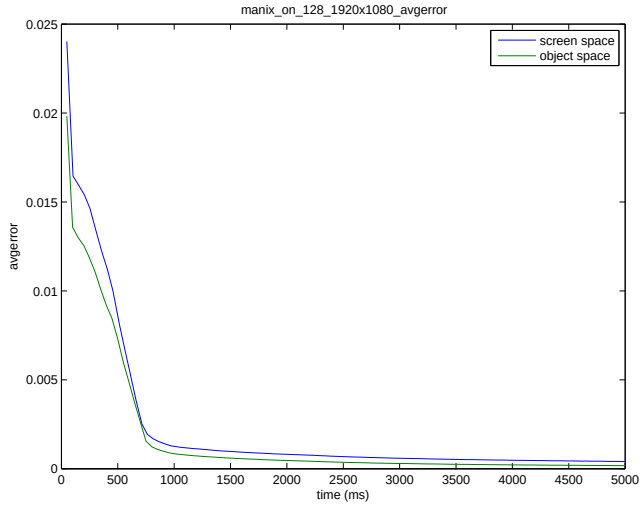


Figure 40: screen space vs object space: average error manix, background on, volume res = 128, screen res = 1920x1080, average error

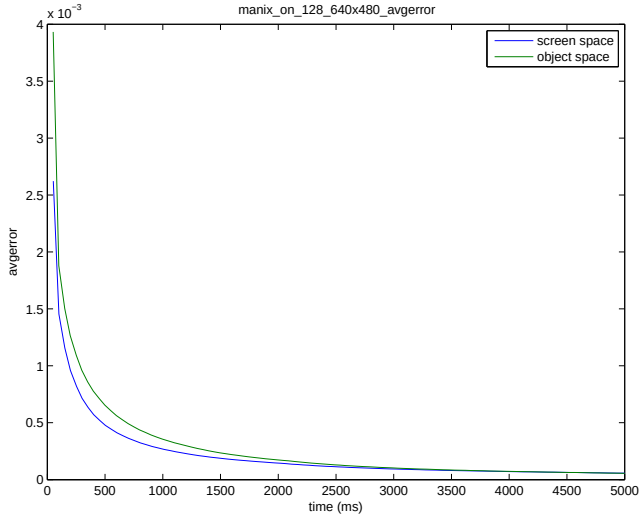


Figure 41: screen space vs object space: average error manix, background on, volume res = 128, screen res = 640x480, average error

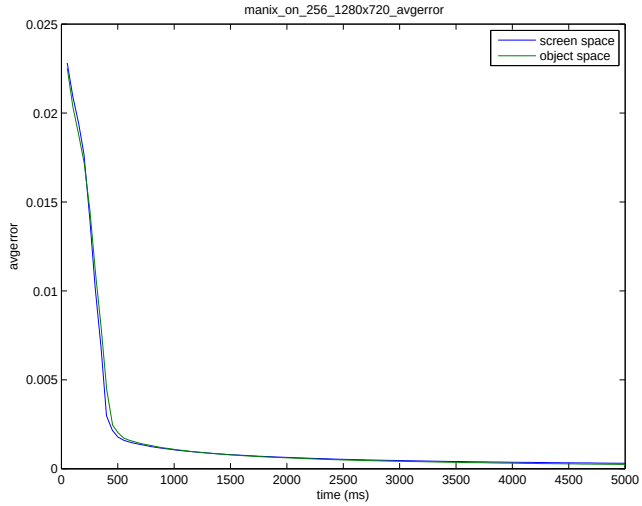


Figure 42: screen space vs object space: average error manix, background on, volume res = 256, screen res = 1280x720, average error

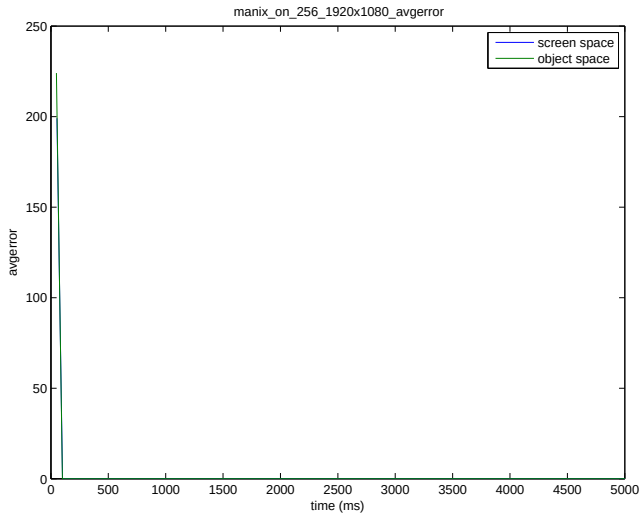


Figure 43: screen space vs object space: average error manix, background on, volume res = 256, screen res = 1920x1080, average error

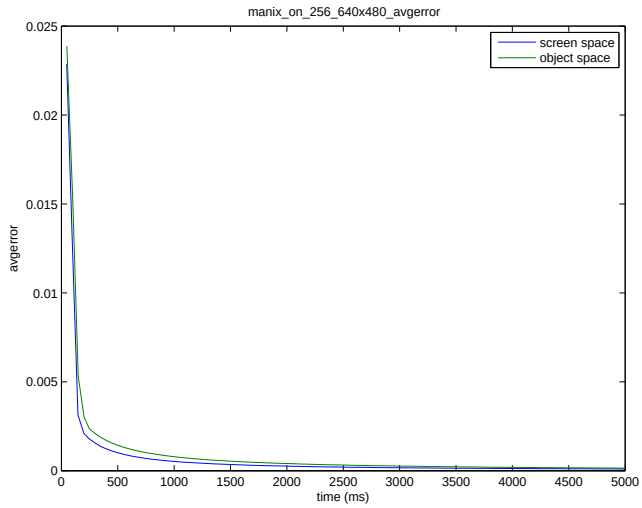


Figure 44: screen space vs object space: average error manix, background on, volume res = 256, screen res = 640x480, average error

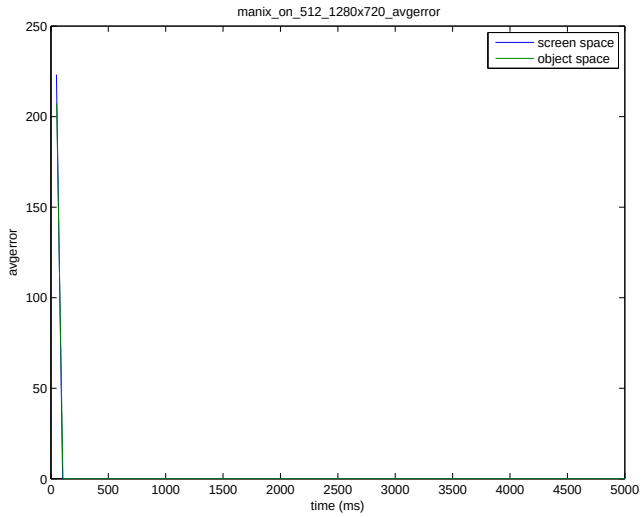


Figure 45: screen space vs object space: average error manix, background on, volume res = 512, screen res = 1280x720, average error

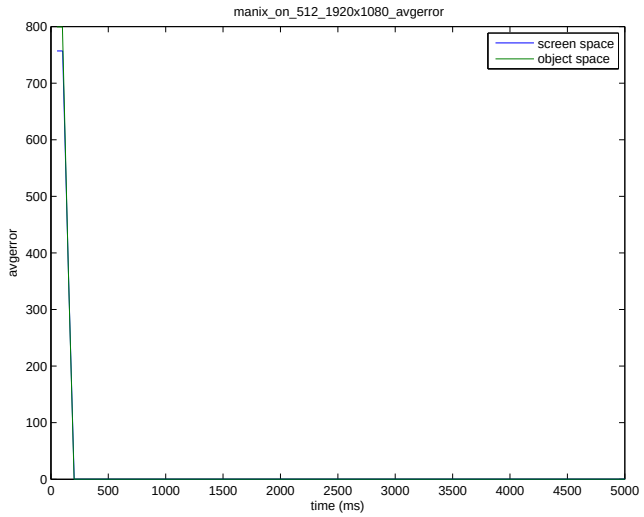


Figure 46: screen space vs object space: average error manix, background on, volume res = 512, screen res = 1920x1080, average error

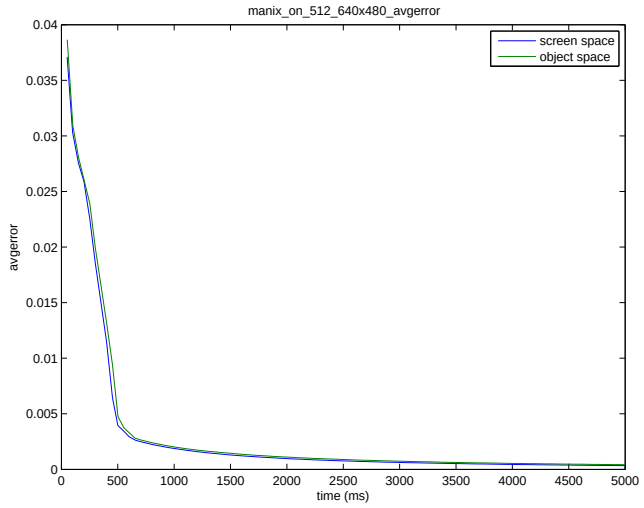


Figure 47: screen space vs object space: average error manix, background on, volume res = 512, screen res = 640x480, average error

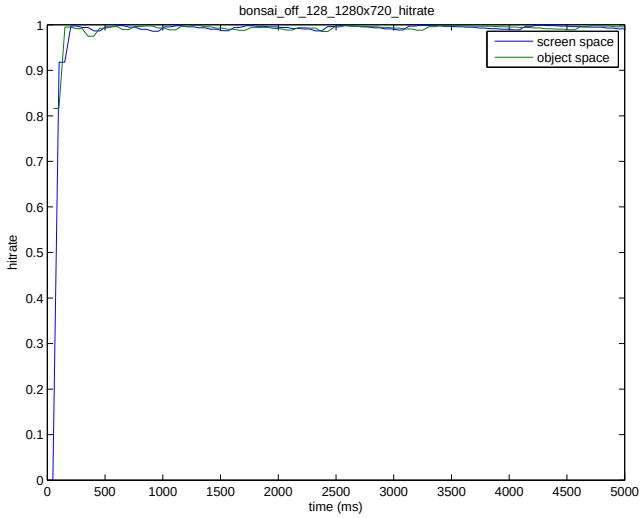


Figure 48: screen space vs object space: cache hit rate bonsai, background off, volume res = 128, screen res = 1280x720, cache hit rate

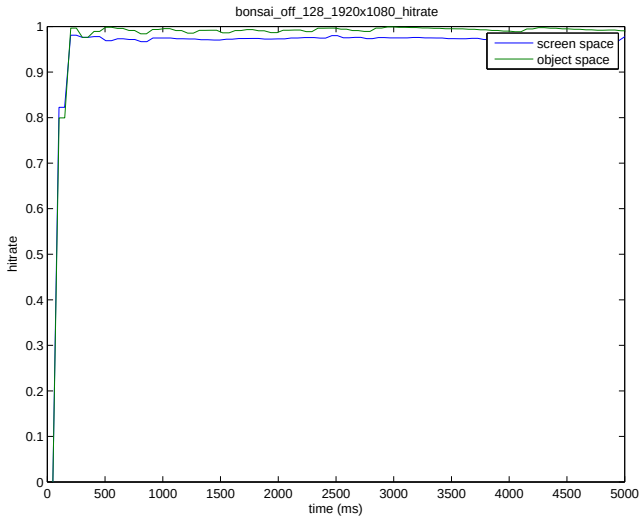


Figure 49: screen space vs object space: cache hit rate bonsai, background off, volume res = 128, screen res = 1920x1080, cache hit rate

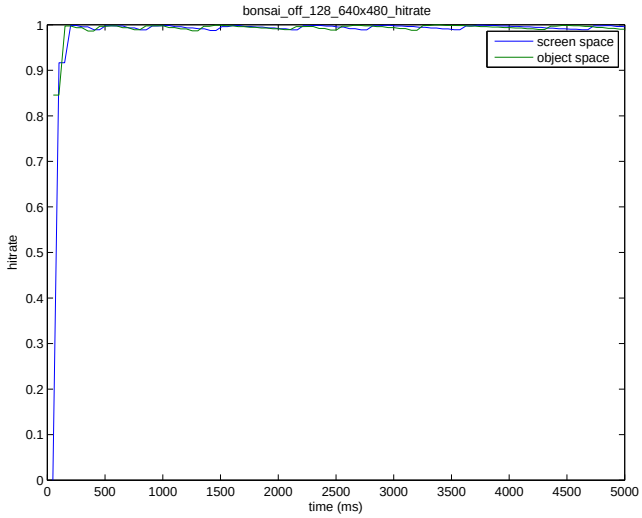


Figure 50: screen space vs object space: cache hit rate bonsai, background off, volume res = 128, screen res = 640x480, cache hit rate

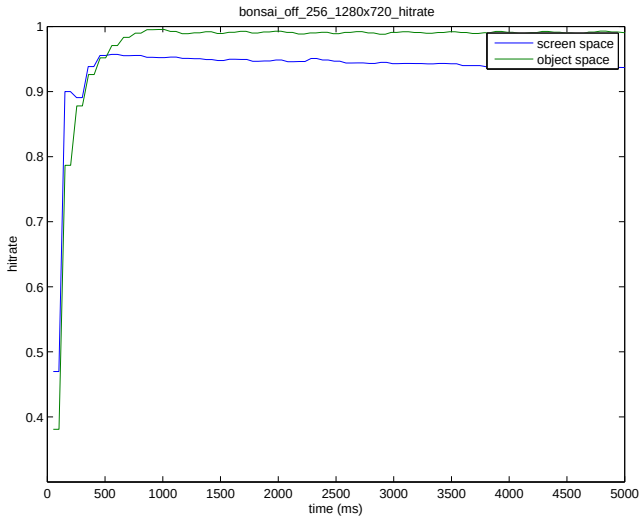


Figure 51: screen space vs object space: cache hit rate bonsai, background off, volume res = 256, screen res = 1280x720, cache hit rate

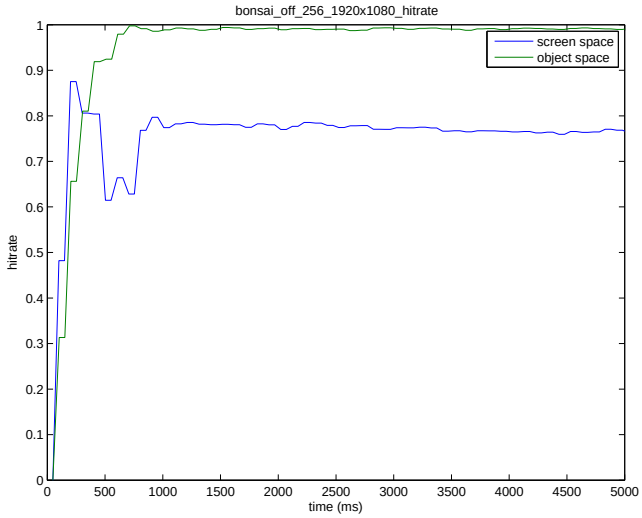


Figure 52: screen space vs object space: cache hit rate bonsai, background off, volume res = 256, screen res = 1920x1080, cache hit rate

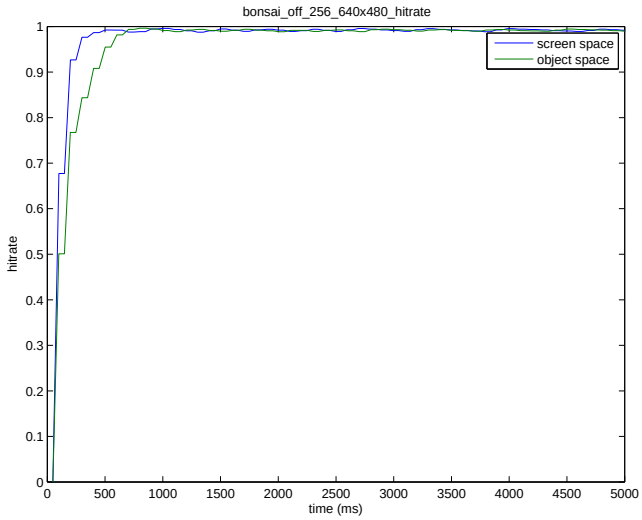


Figure 53: screen space vs object space: cache hit rate bonsai, background off, volume res = 256, screen res = 640x480, cache hit rate

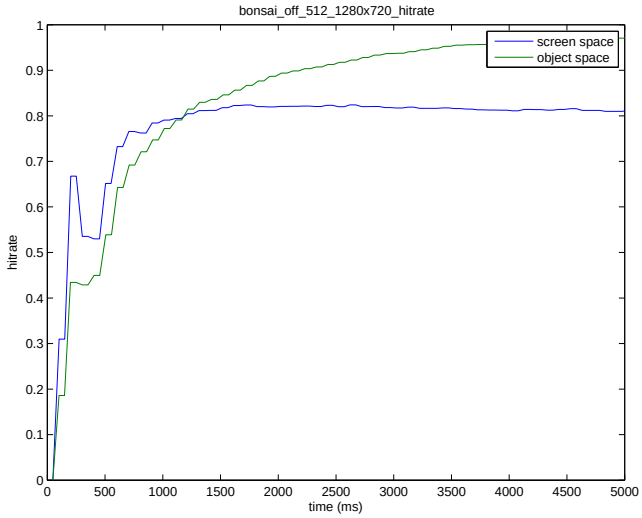


Figure 54: screen space vs object space: cache hit rate bonsai, background off, volume res = 512, screen res = 1280x720, cache hit rate

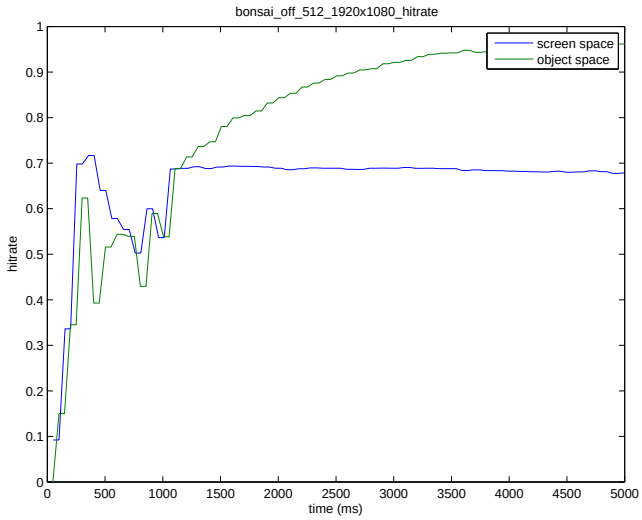


Figure 55: screen space vs object space: cache hit rate bonsai, background off, volume res = 512, screen res = 1920x1080, cache hit rate

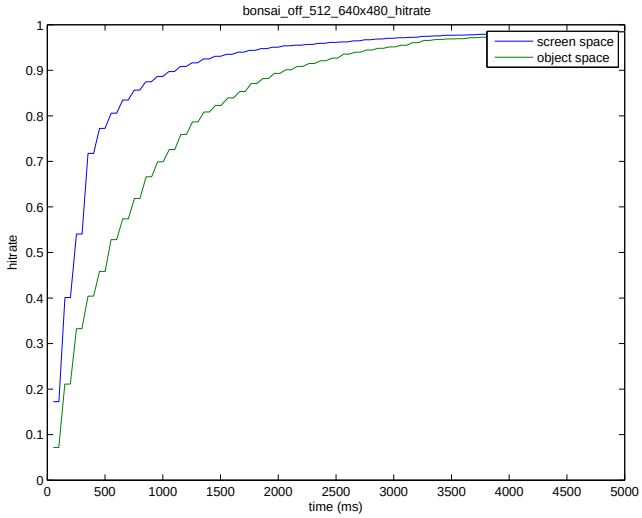


Figure 56: screen space vs object space: cache hit rate bonsai, background off, volume res = 512, screen res = 640x480, cache hit rate

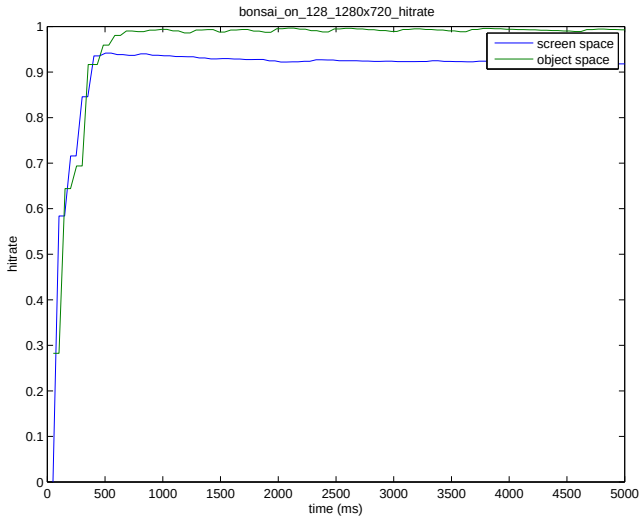


Figure 57: screen space vs object space: cache hit rate bonsai, background on, volume res = 128, screen res = 1280x720, cache hit rate

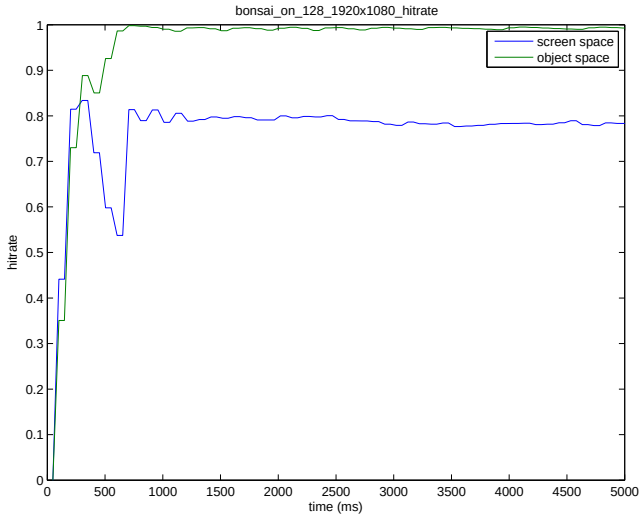


Figure 58: screen space vs object space: cache hit rate bonsai, background on, volume res = 128, screen res = 1920x1080, cache hit rate

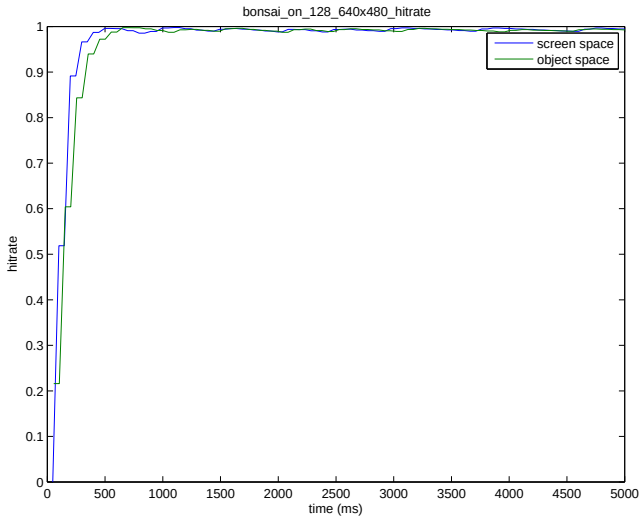


Figure 59: screen space vs object space: cache hit rate bonsai, background on, volume res = 128, screen res = 640x480, cache hit rate

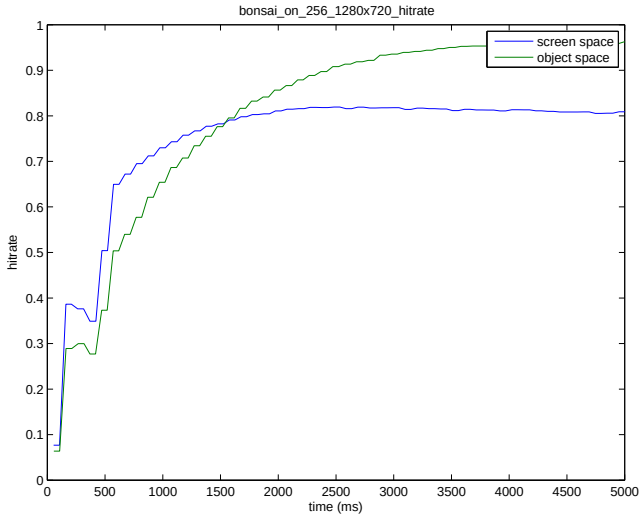


Figure 60: screen space vs object space: cache hit rate bonsai, background on, volume res = 256, screen res = 1280x720, cache hit rate

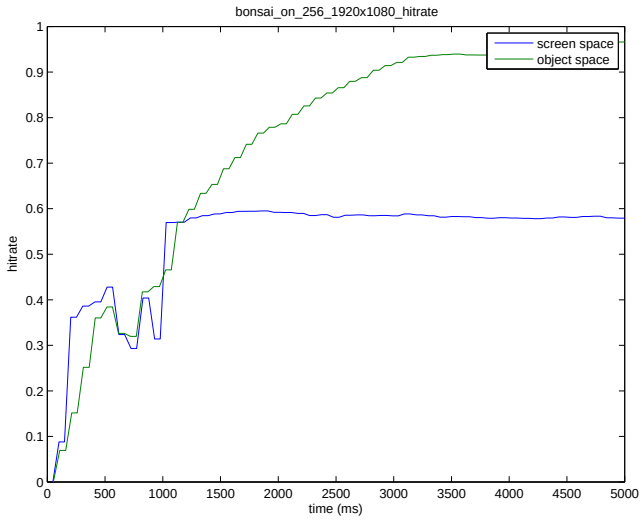


Figure 61: screen space vs object space: cache hit rate bonsai, background on, volume res = 256, screen res = 1920x1080, cache hit rate

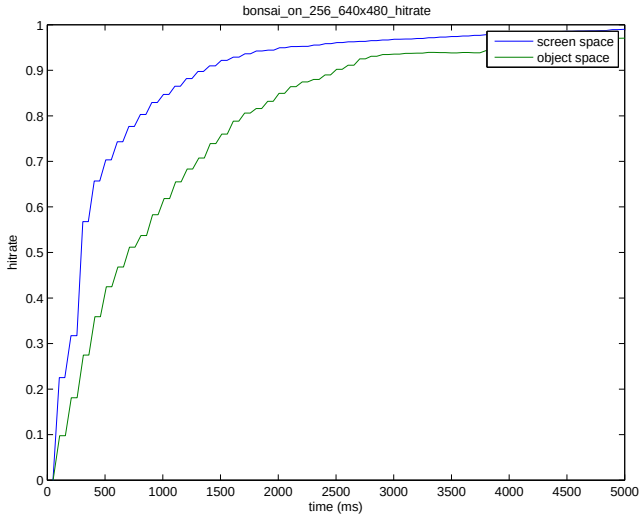


Figure 62: screen space vs object space: cache hit rate bonsai, background on, volume res = 256, screen res = 640x480, cache hit rate

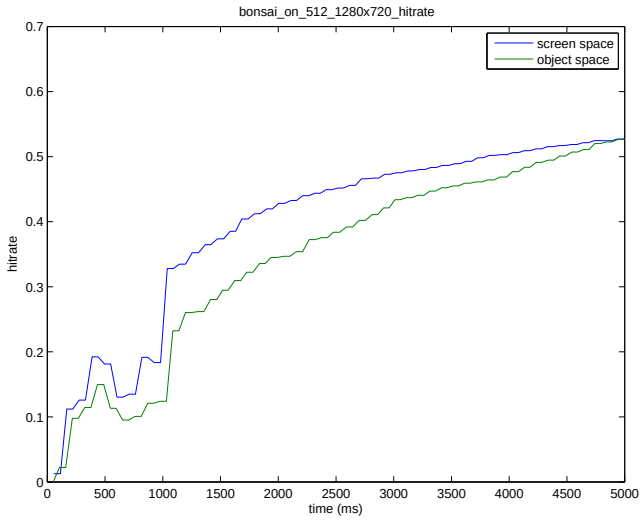


Figure 63: screen space vs object space: cache hit rate bonsai, background on, volume res = 512, screen res = 1280x720, cache hit rate

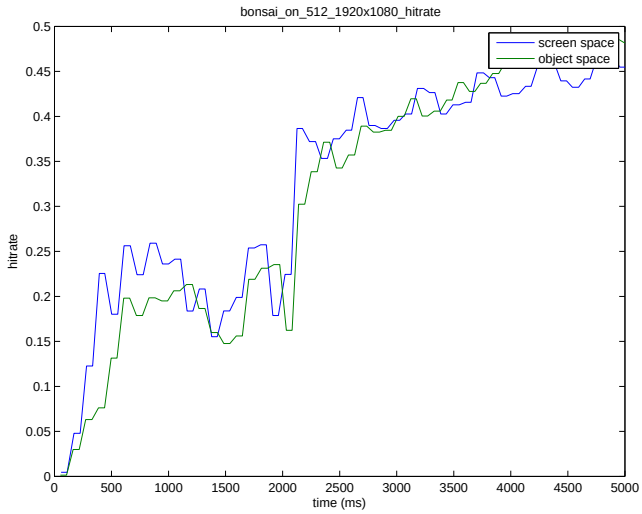


Figure 64: screen space vs object space: cache hit rate bonsai, background on, volume res = 512, screen res = 1920x1080, cache hit rate

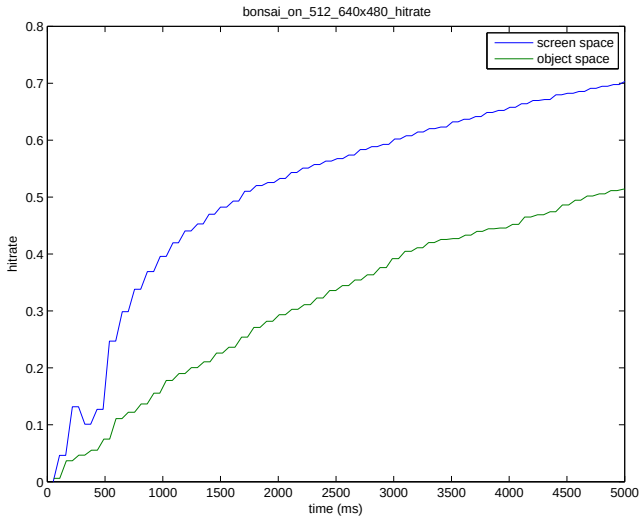


Figure 65: screen space vs object space: cache hit rate bonsai, background on, volume res = 512, screen res = 640x480, cache hit rate

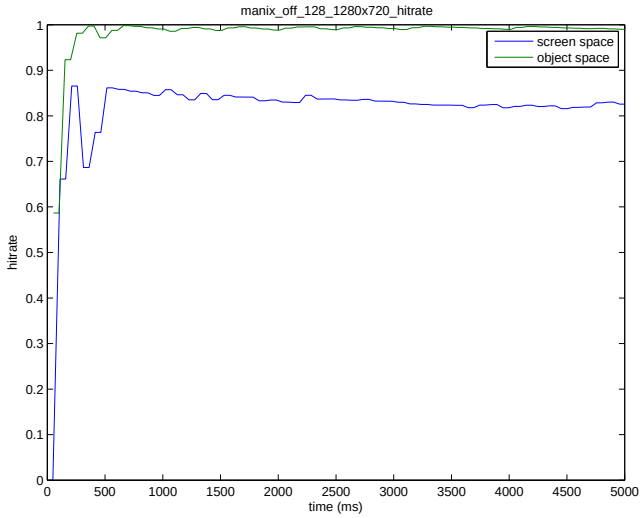


Figure 66: screen space vs object space: cache hit rate manix, background off, volume res = 128, screen res = 1280x720, cache hit rate

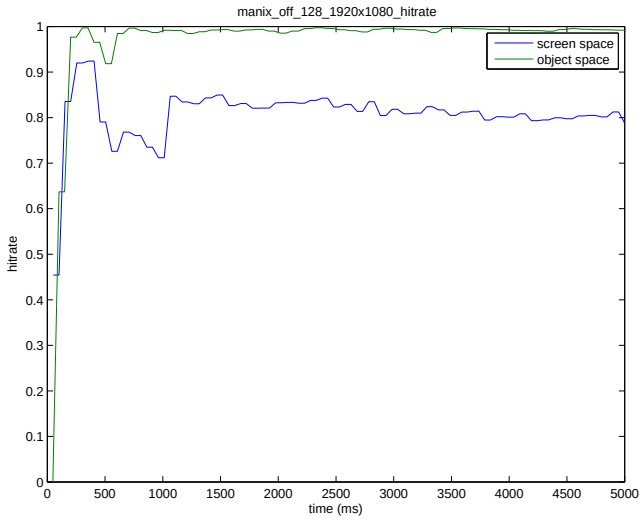


Figure 67: screen space vs object space: cache hit rate manix, background off, volume res = 128, screen res = 1920x1080, cache hit rate

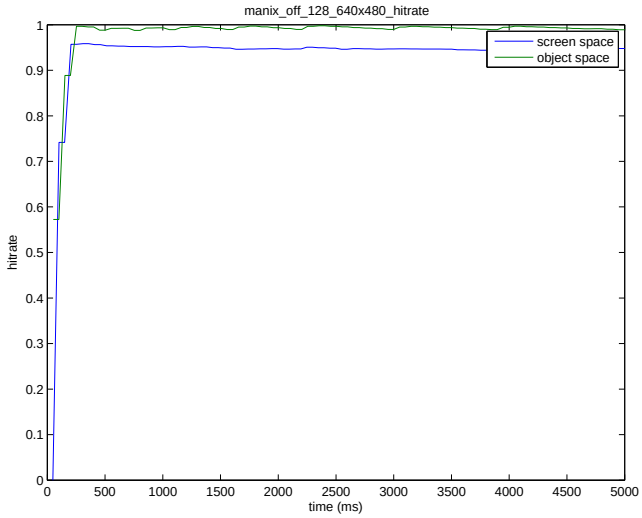


Figure 68: screen space vs object space: cache hit rate manix, background off, volume res = 128, screen res = 640x480, cache hit rate

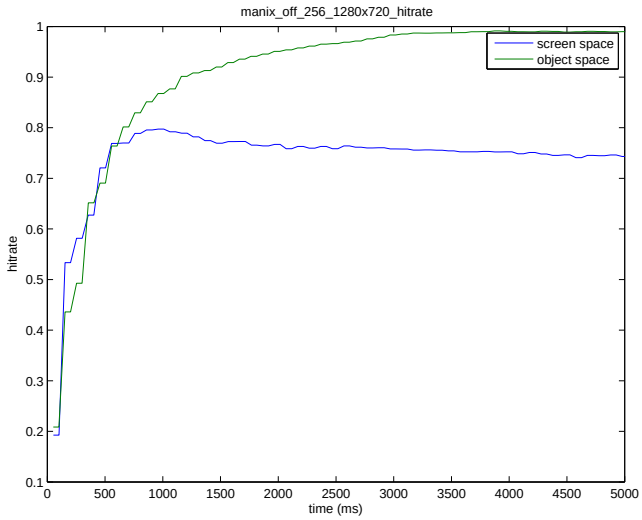


Figure 69: screen space vs object space: cache hit rate manix, background off, volume res = 256, screen res = 1280x720, cache hit rate

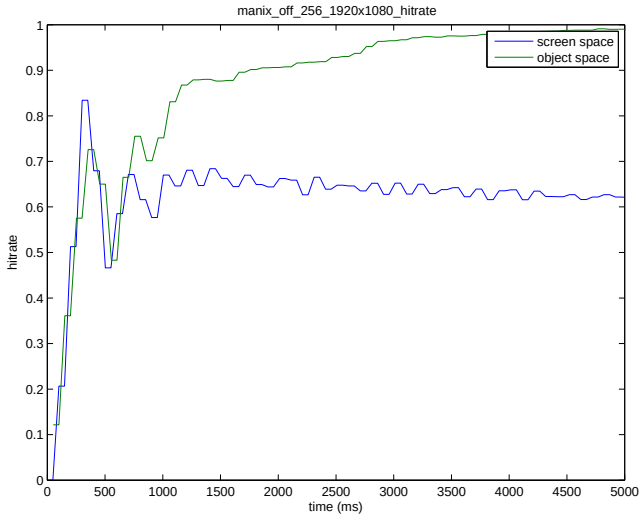


Figure 70: screen space vs object space: cache hit rate manix, background off, volume res = 256, screen res = 1920x1080, cache hit rate

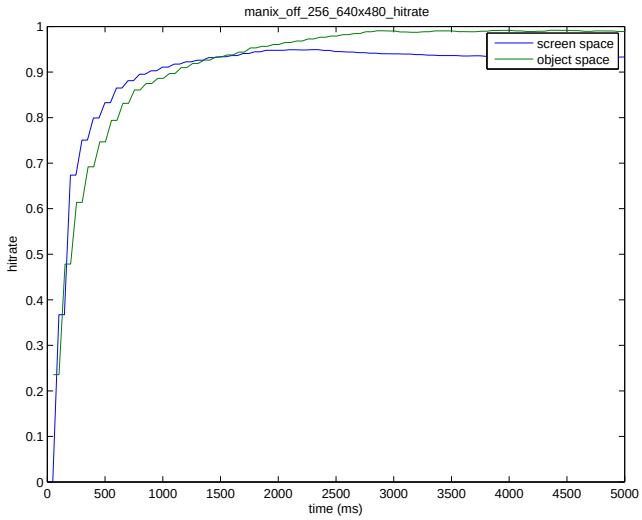


Figure 71: screen space vs object space: cache hit rate manix, background off, volume res = 256, screen res = 640x480, cache hit rate

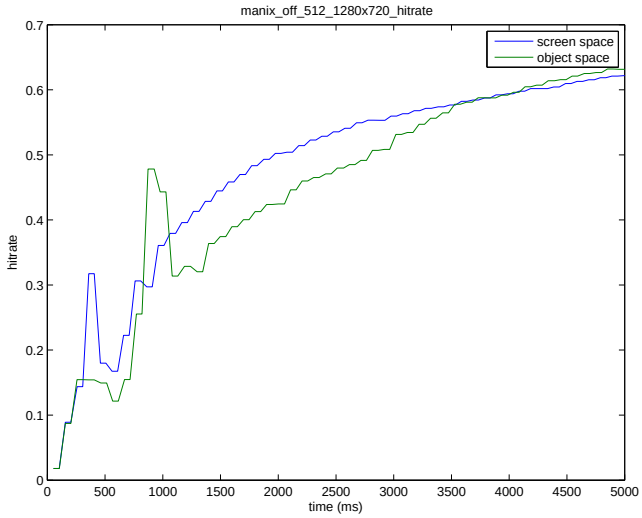


Figure 72: screen space vs object space: cache hit rate manix, background off, volume res = 512, screen res = 1280x720, cache hit rate

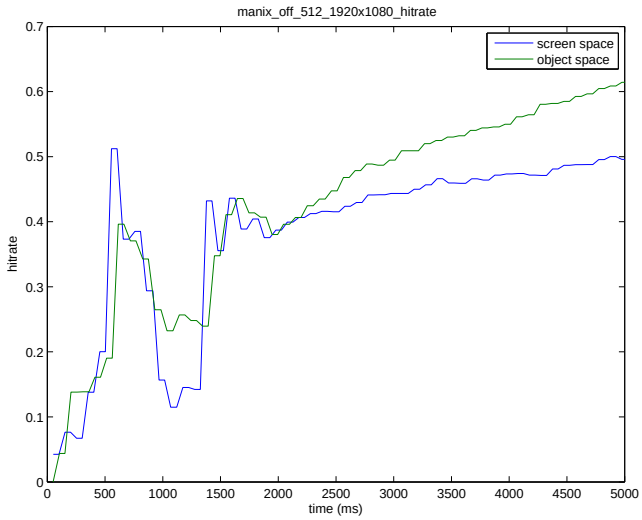


Figure 73: screen space vs object space: cache hit rate manix, background off, volume res = 512, screen res = 1920x1080, cache hit rate

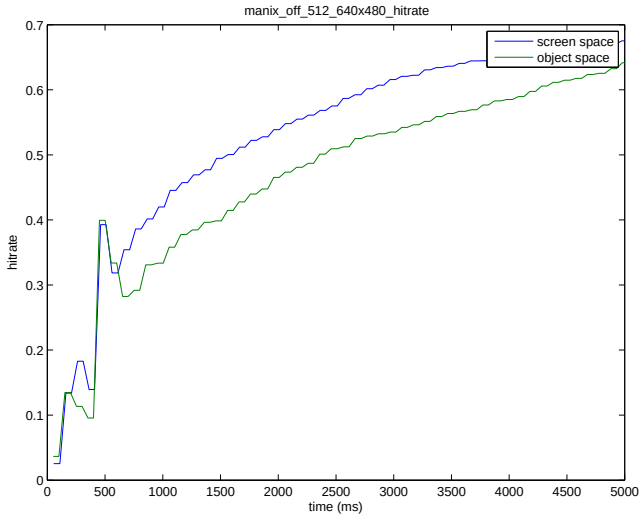


Figure 74: screen space vs object space: cache hit rate manix, background off, volume res = 512, screen res = 640x480, cache hit rate

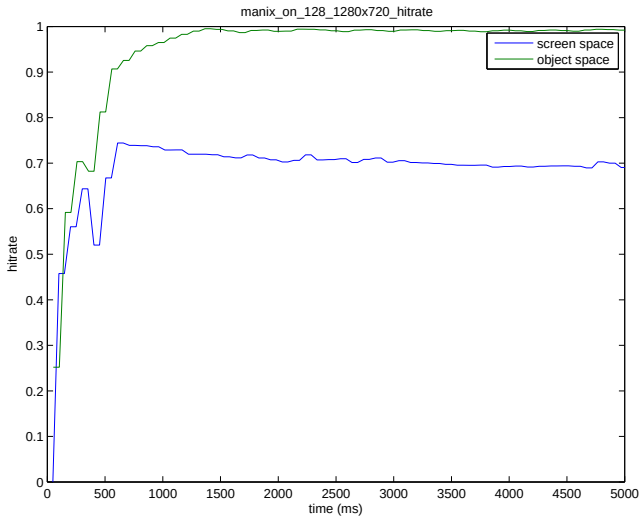


Figure 75: screen space vs object space: cache hit rate manix, background on, volume res = 128, screen res = 1280x720, cache hit rate

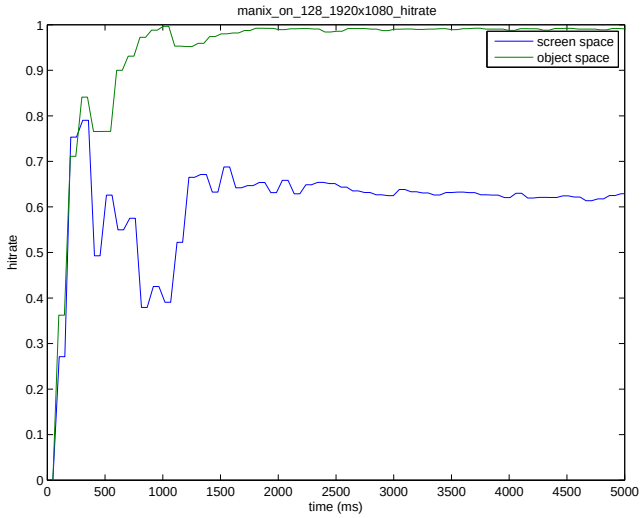


Figure 76: screen space vs object space: cache hit rate manix, background on, volume res = 128, screen res = 1920x1080, cache hit rate

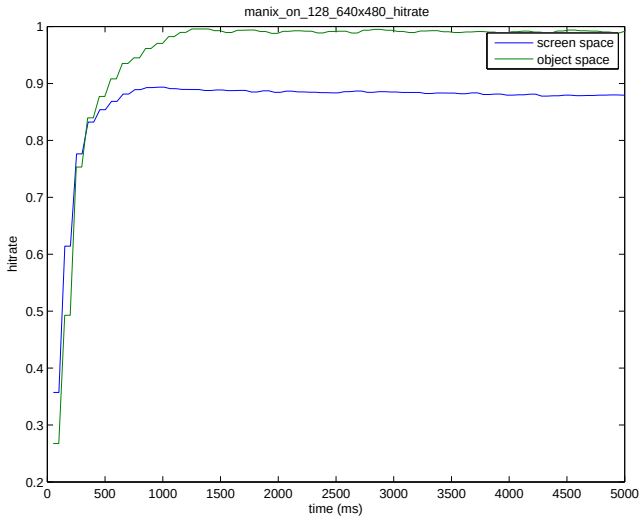


Figure 77: screen space vs object space: cache hit rate manix, background on, volume res = 128, screen res = 640x480, cache hit rate

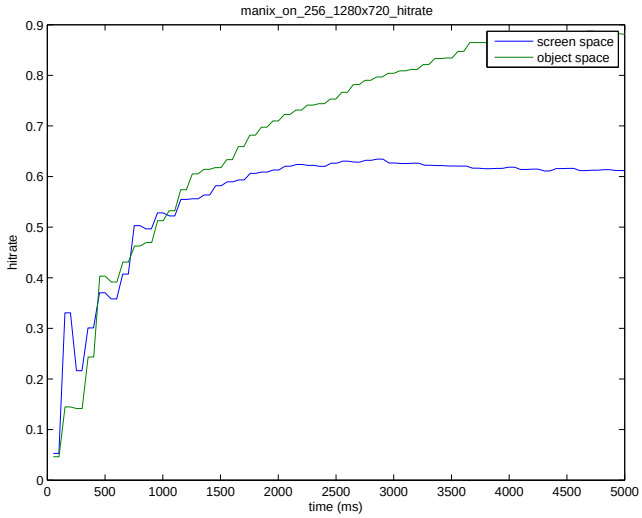


Figure 78: screen space vs object space: cache hit rate manix, background on, volume res = 256, screen res = 1280x720, cache hit rate

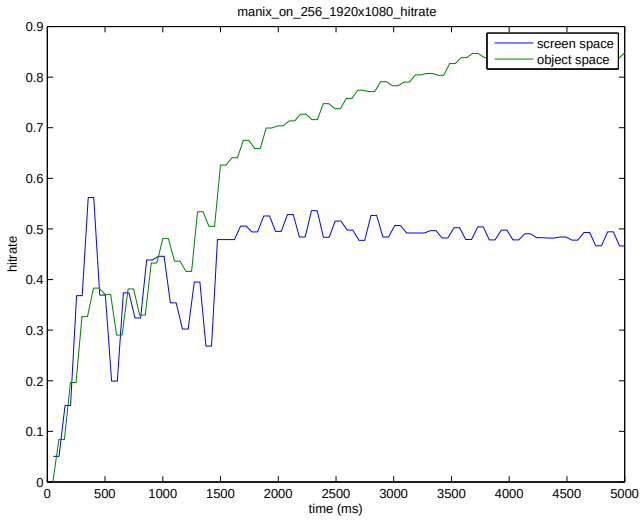


Figure 79: screen space vs object space: cache hit rate manix, background on, volume res = 256, screen res = 1920x1080, cache hit rate

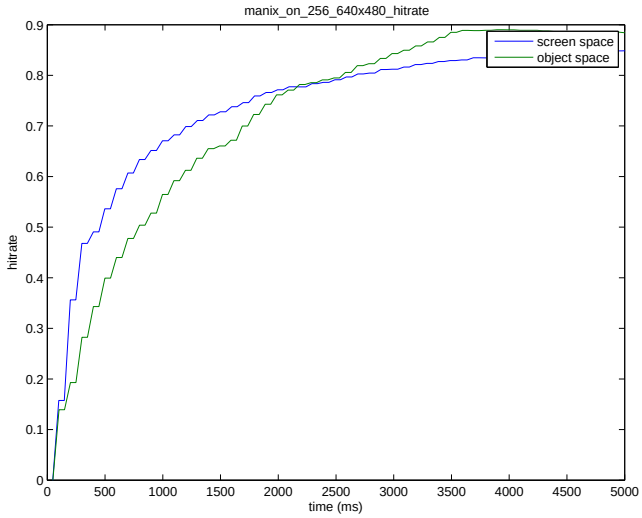


Figure 80: screen space vs object space: cache hit rate manix, background on, volume res = 256, screen res = 640x480, cache hit rate

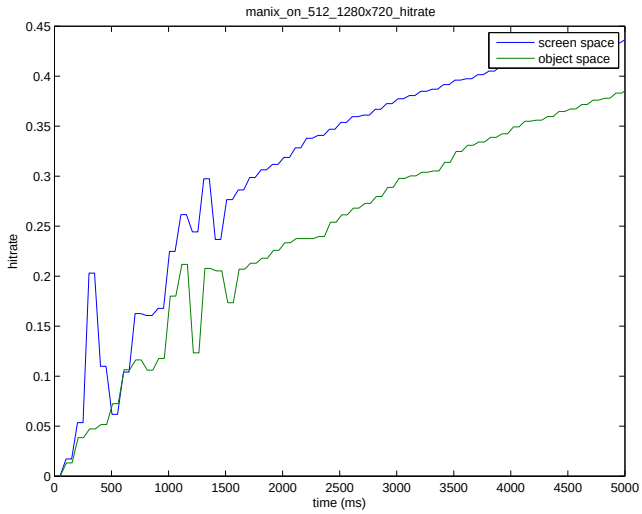


Figure 81: screen space vs object space: cache hit rate manix, background on, volume res = 512, screen res = 1280x720, cache hit rate

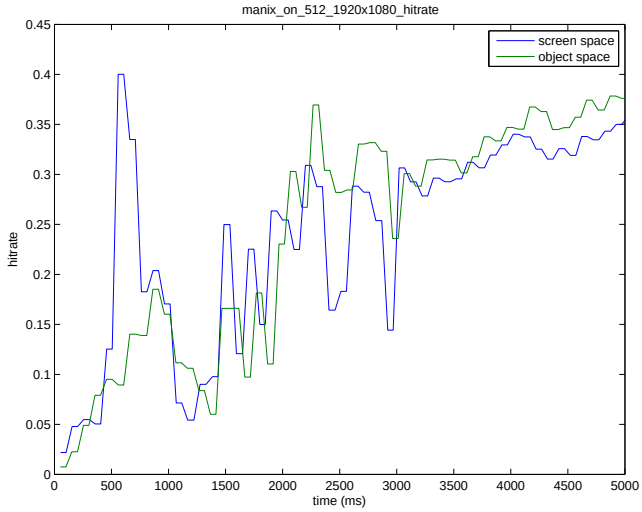


Figure 82: screen space vs object space: cache hit rate manix, background on, volume res = 512, screen res = 1920x1080, cache hit rate

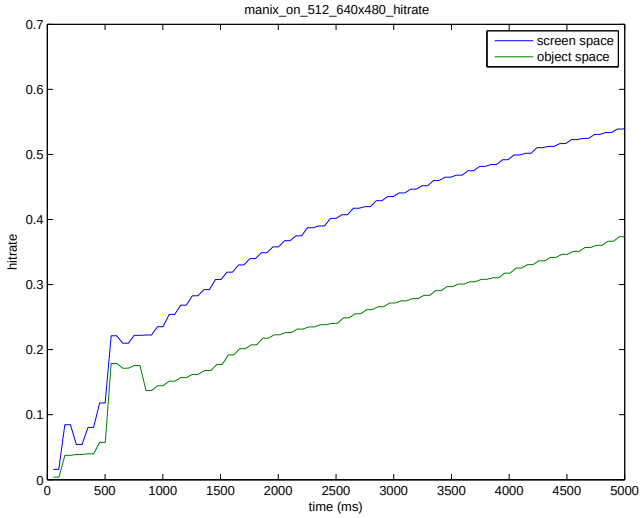


Figure 83: screen space vs object space: cache hit rate manix, background on, volume res = 512, screen res = 640x480, cache hit rate

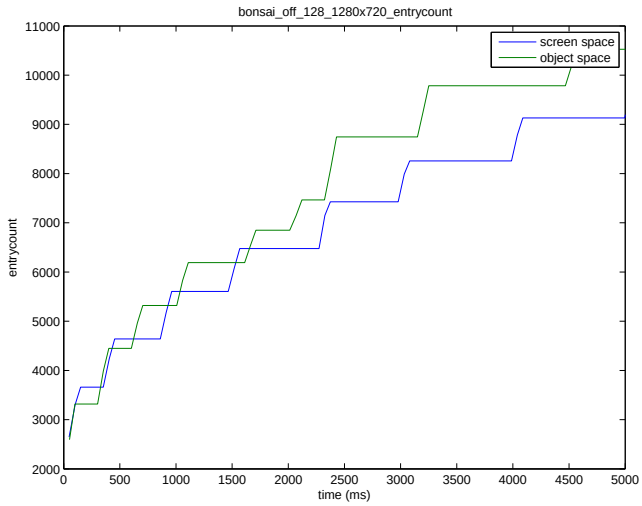


Figure 84: screen space vs object space: number of entries bonsai, background off, volume res = 128, screen res = 1280x720, entrycount

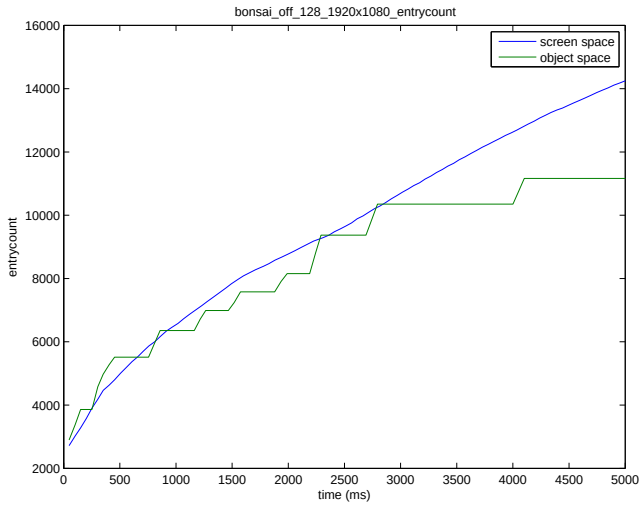


Figure 85: screen space vs object space: number of entries bonsai, background off, volume res = 128, screen res = 1920x1080, entrycount

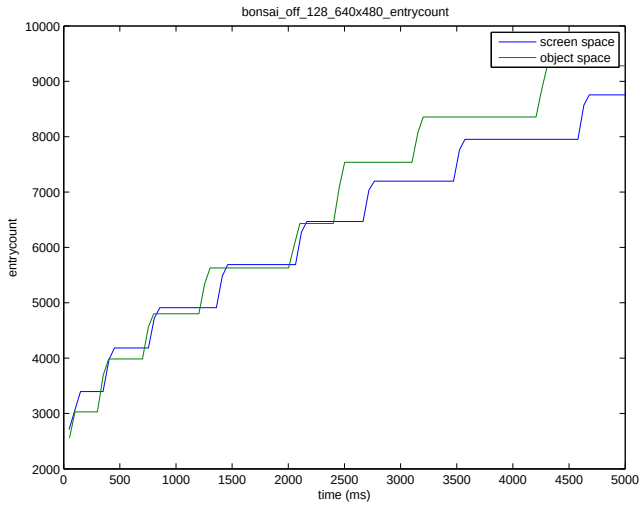


Figure 86: screen space vs object space: number of entries bonsai, background off, volume res = 128, screen res = 640x480, entrycount

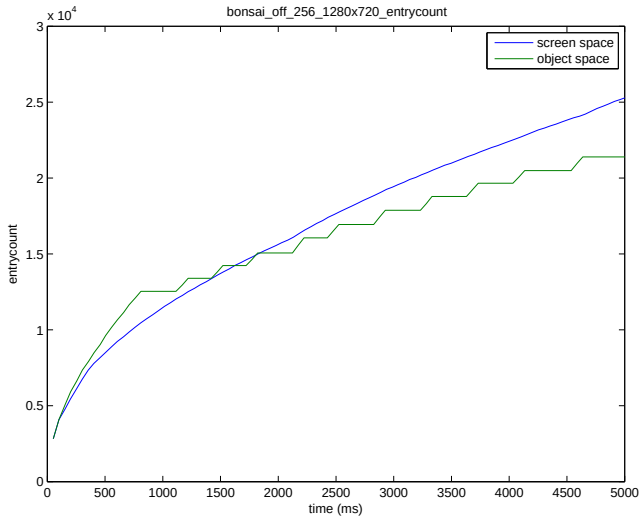


Figure 87: screen space vs object space: number of entries bonsai, background off, volume res = 256, screen res = 1280x720, entrycount

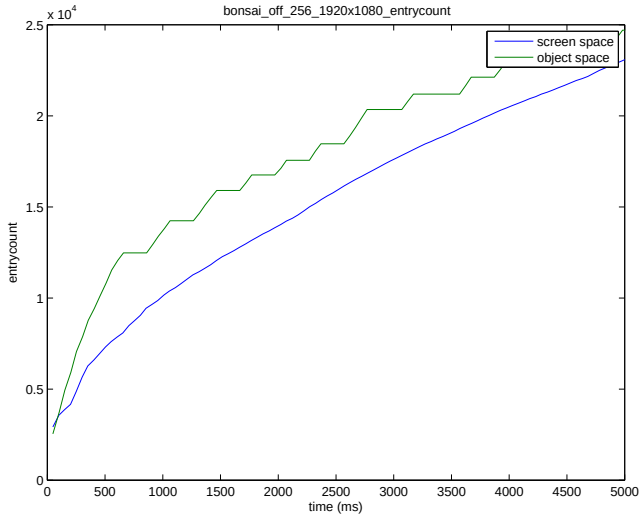


Figure 88: screen space vs object space: number of entries bonsai, background off, volume res = 256, screen res = 1920x1080, entrycount

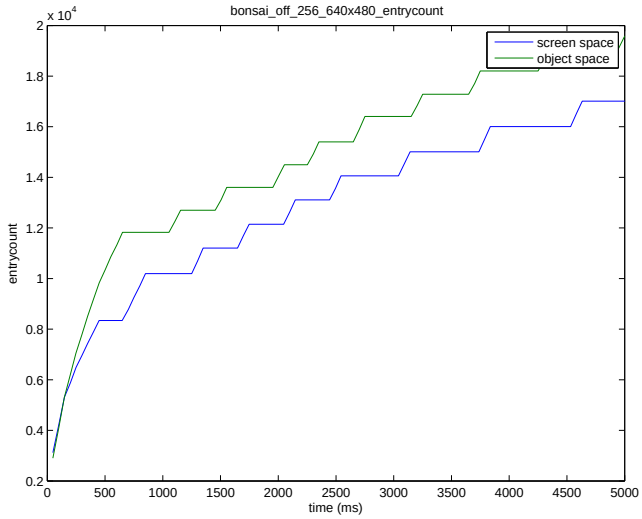


Figure 89: screen space vs object space: number of entries bonsai, background off, volume res = 256, screen res = 640x480, entrycount

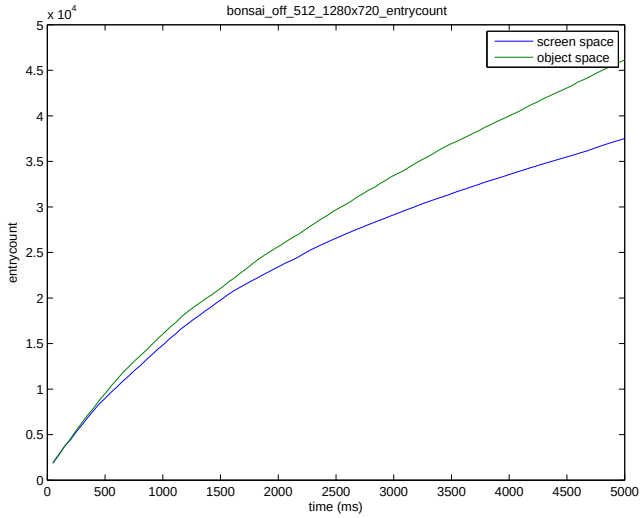


Figure 90: screen space vs object space: number of entries bonsai, background off, volume res = 512, screen res = 1280x720, entrycount

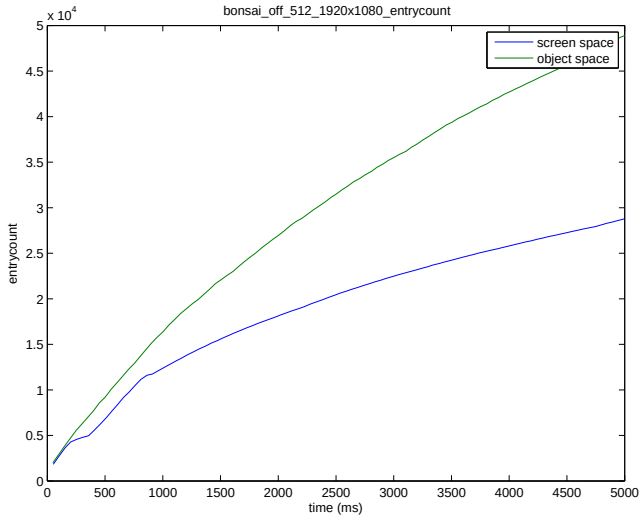


Figure 91: screen space vs object space: number of entries bonsai, background off, volume res = 512, screen res = 1920x1080, entrycount

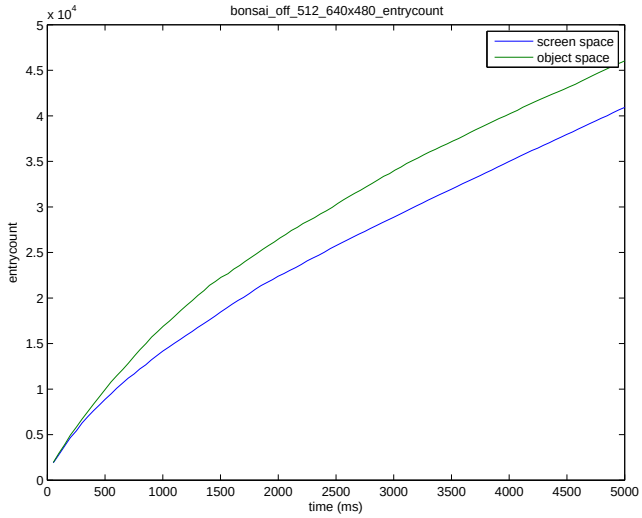


Figure 92: screen space vs object space: number of entries bonsai, background off, volume res = 512, screen res = 640x480, entrycount

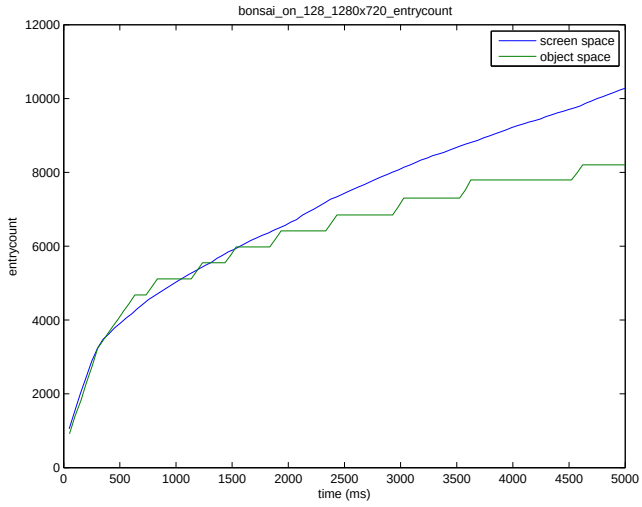


Figure 93: screen space vs object space: number of entries bonsai, background on, volume res = 128, screen res = 1280x720, entrycount

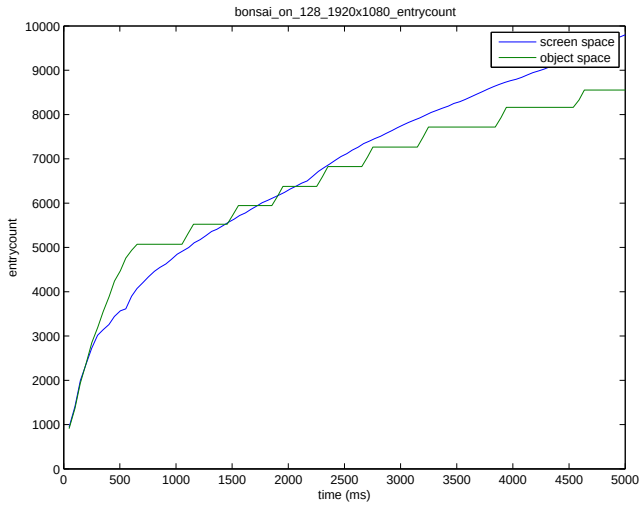


Figure 94: screen space vs object space: number of entries bonsai, background on, volume res = 128, screen res = 1920x1080, entrycount

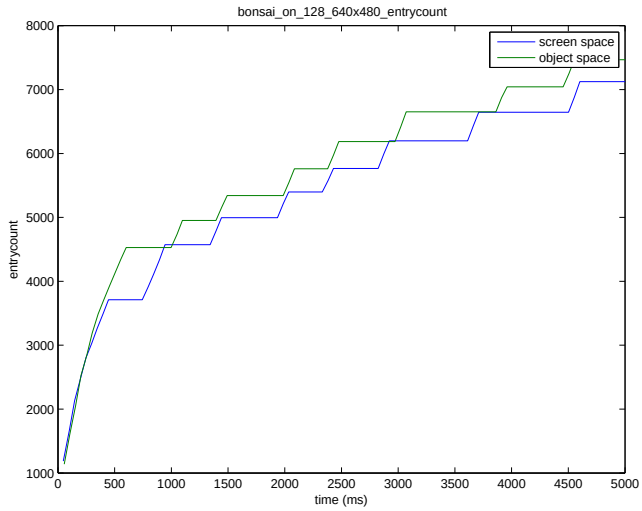


Figure 95: screen space vs object space: number of entries bonsai, background on, volume res = 128, screen res = 640x480, entrycount

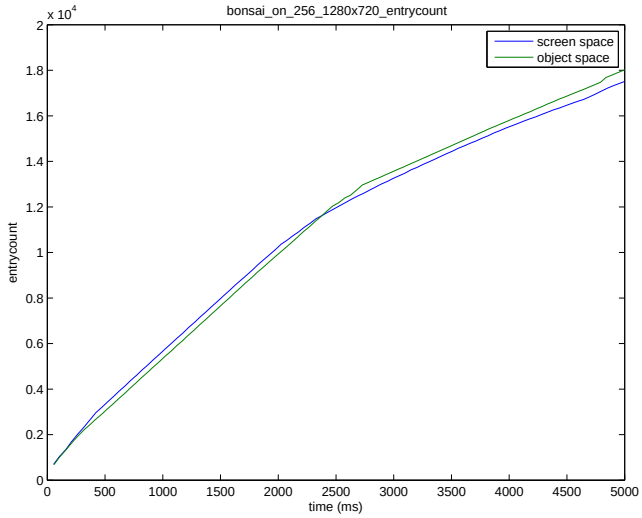


Figure 96: screen space vs object space: number of entries bonsai, background on, volume res = 256, screen res = 1280x720, entrycount

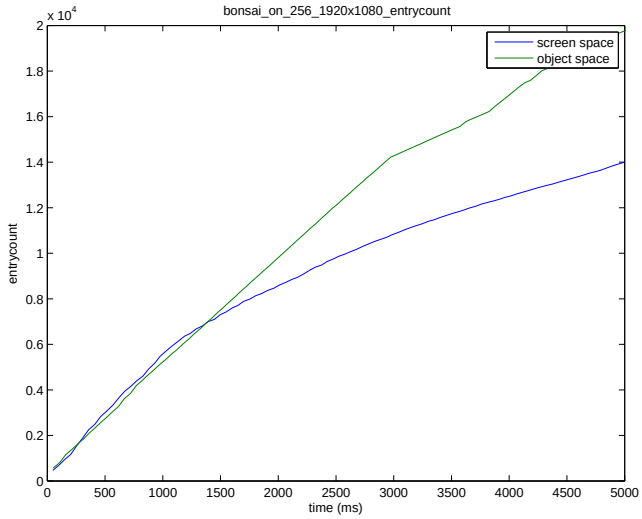


Figure 97: screen space vs object space: number of entries bonsai, background on, volume res = 256, screen res = 1920x1080, entrycount

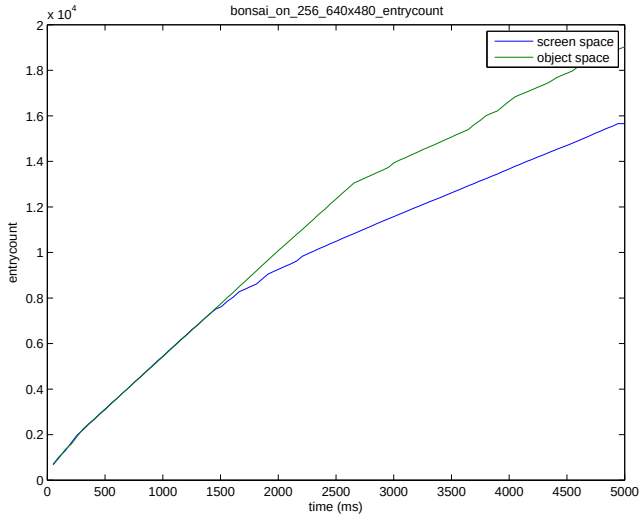


Figure 98: screen space vs object space: number of entries bonsai, background on, volume res = 256, screen res = 640x480, entrycount

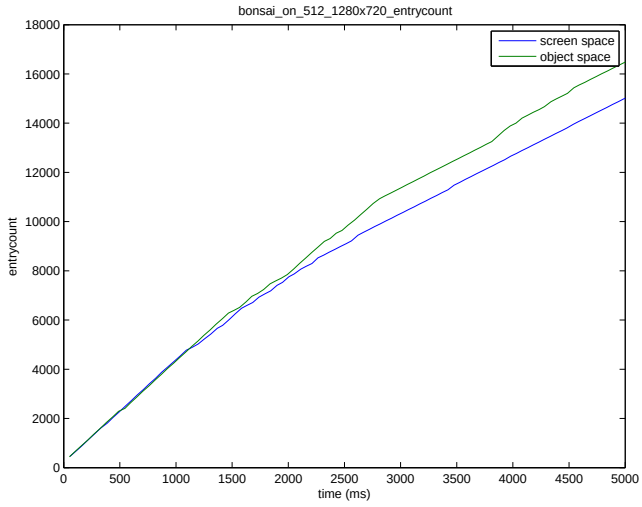


Figure 99: screen space vs object space: number of entries bonsai, background on, volume res = 512, screen res = 1280x720, entrycount

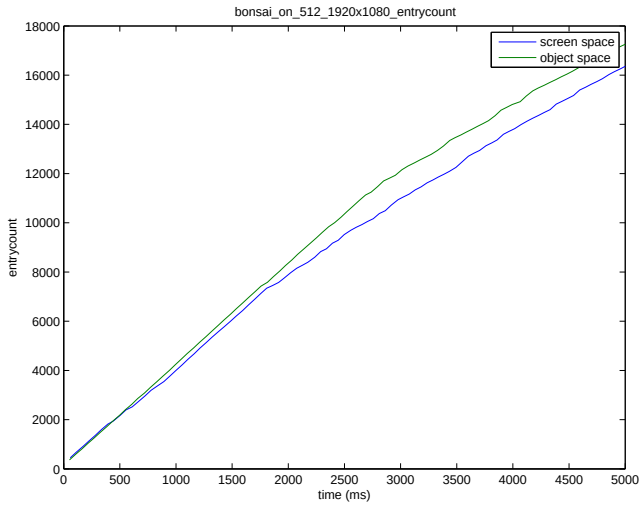


Figure 100: screen space vs object space: number of entries bonsai, background on, volume res = 512, screen res = 1920x1080, entrycount

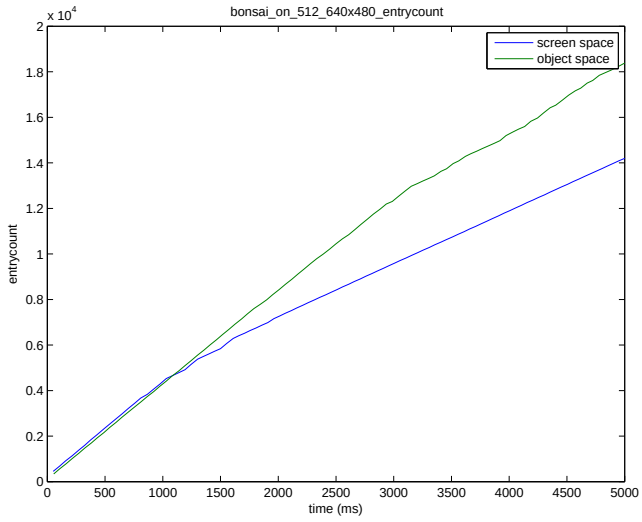


Figure 101: screen space vs object space: number of entries bonsai, background on, volume res = 512, screen res = 640x480, entrycount

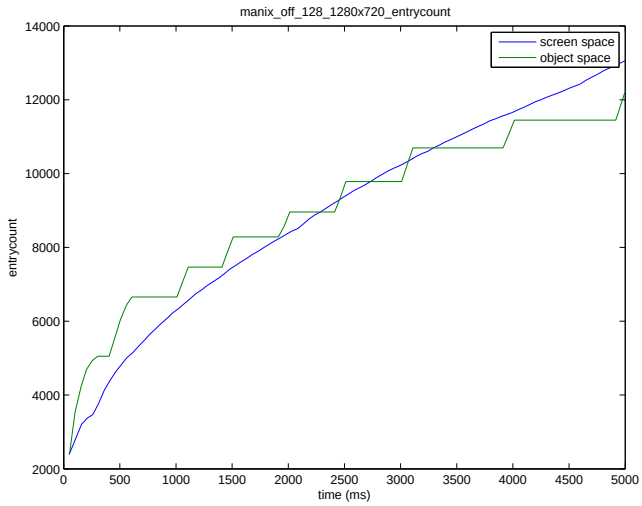


Figure 102: screen space vs object space: number of entries manix, background off, volume res = 128, screen res = 1280x720, entrycount

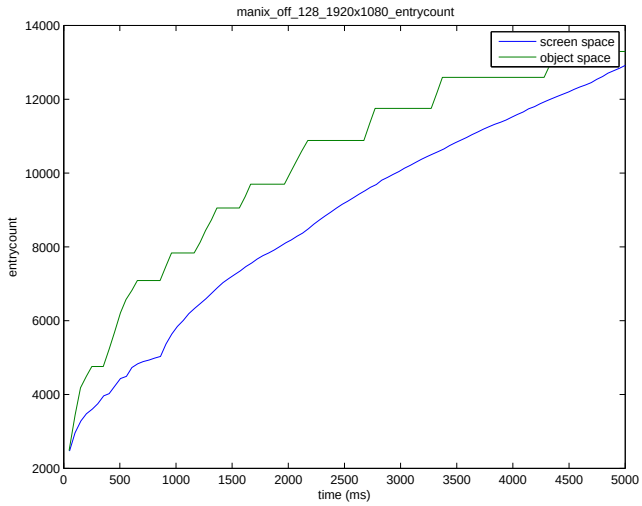


Figure 103: screen space vs object space: number of entries manix, background off, volume res = 128, screen res = 1920x1080, entrycount

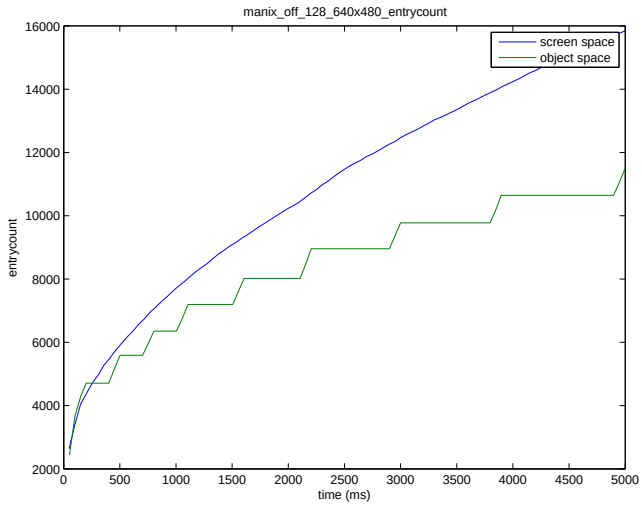


Figure 104: screen space vs object space: number of entries manix, background off, volume res = 128, screen res = 640x480, entrycount

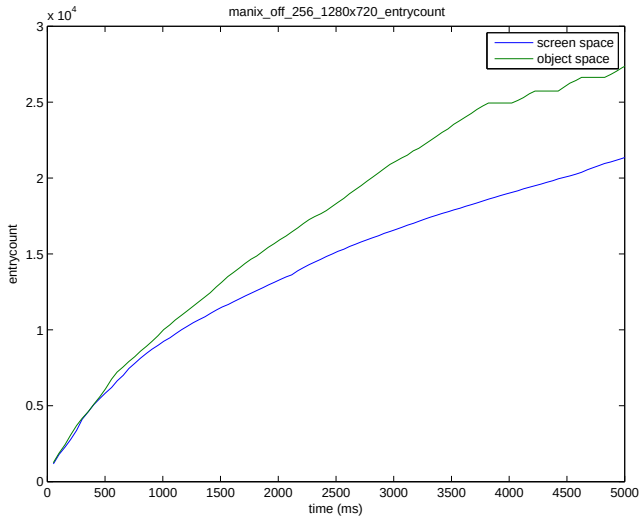


Figure 105: screen space vs object space: number of entries manix, background off, volume res = 256, screen res = 1280x720, entrycount

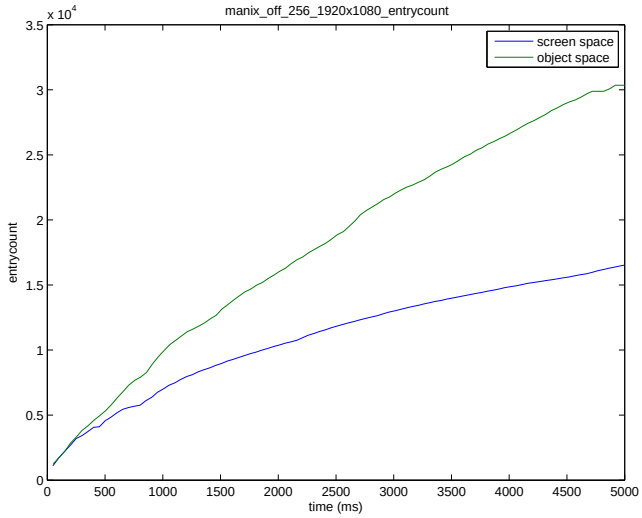


Figure 106: screen space vs object space: number of entries manix, background off, volume res = 256, screen res = 1920x1080, entrycount

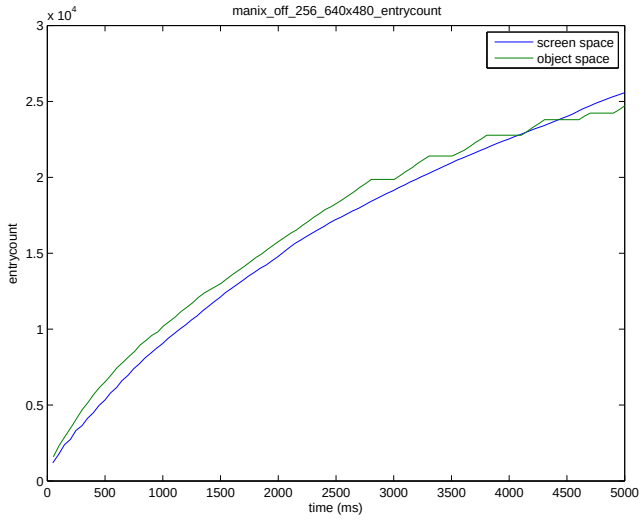


Figure 107: screen space vs object space: number of entries manix, background off, volume res = 256, screen res = 640x480, entrycount

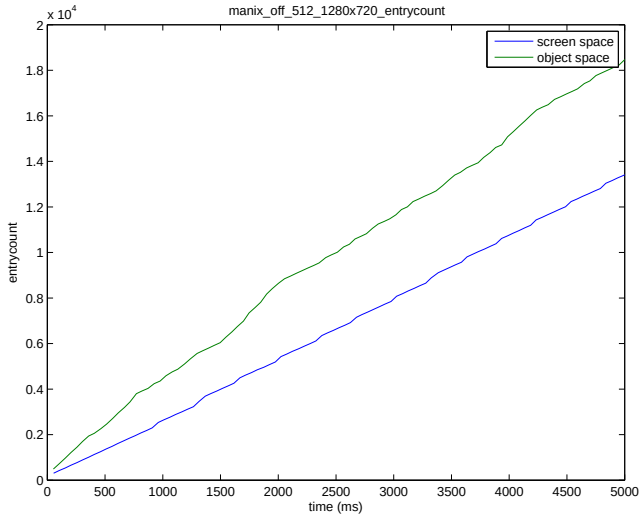


Figure 108: screen space vs object space: number of entries manix, background off, volume res = 512, screen res = 1280x720, entrycount

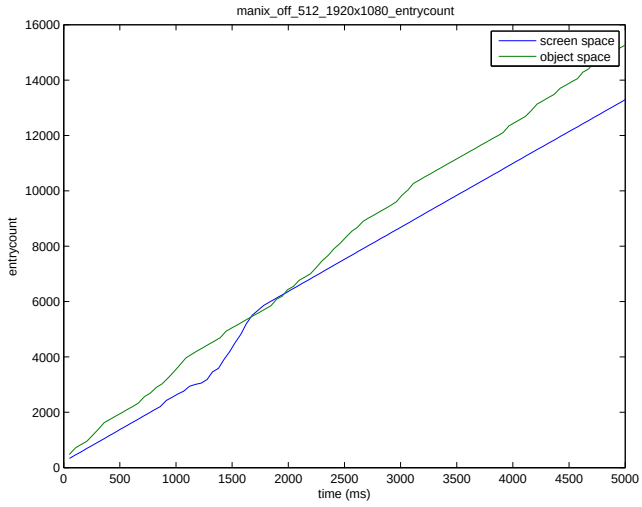


Figure 109: screen space vs object space: number of entries manix, background off, volume res = 512, screen res = 1920x1080, entrycount

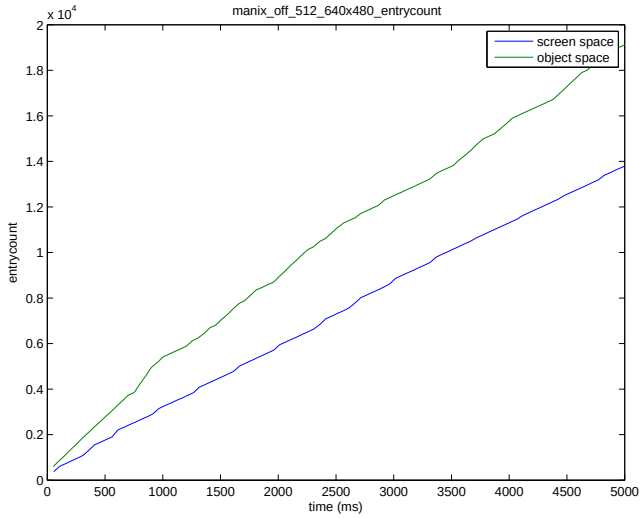


Figure 110: screen space vs object space: number of entries manix, background off, volume res = 512, screen res = 640x480, entrycount

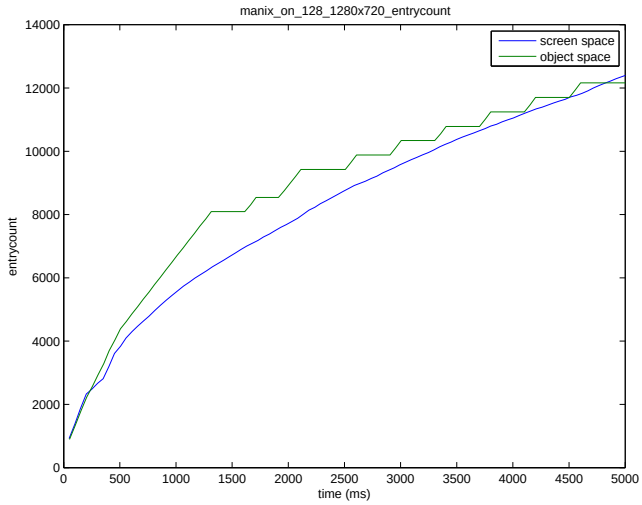


Figure 111: screen space vs object space: number of entries manix, background on, volume res = 128, screen res = 1280x720, entrycount

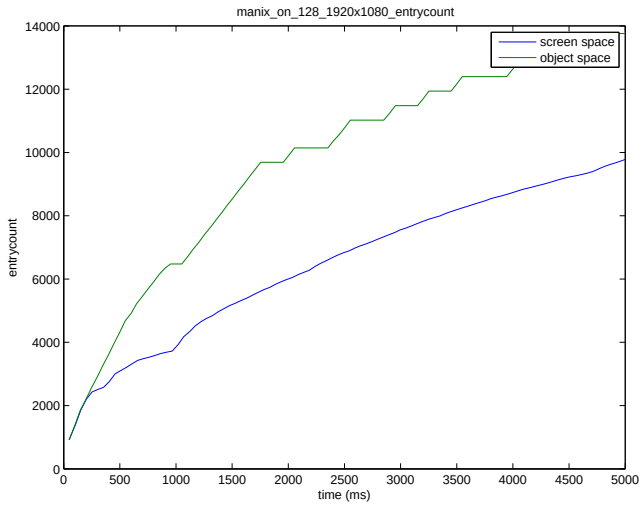


Figure 112: screen space vs object space: number of entries manix, background on, volume res = 128, screen res = 1920x1080, entrycount

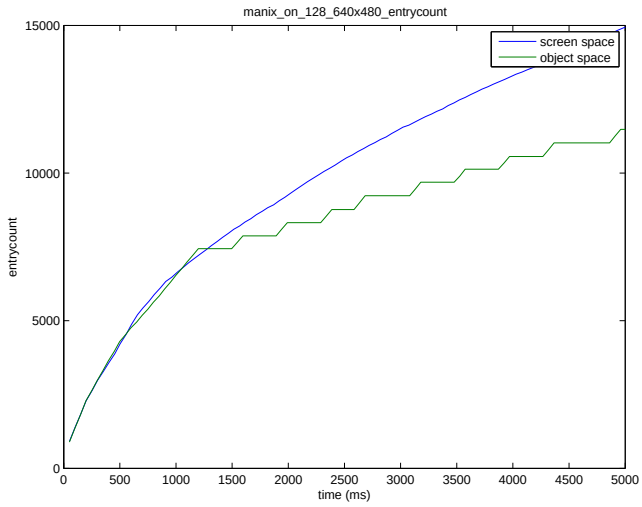


Figure 113: screen space vs object space: number of entries manix, background on, volume res = 128, screen res = 640x480, entrycount

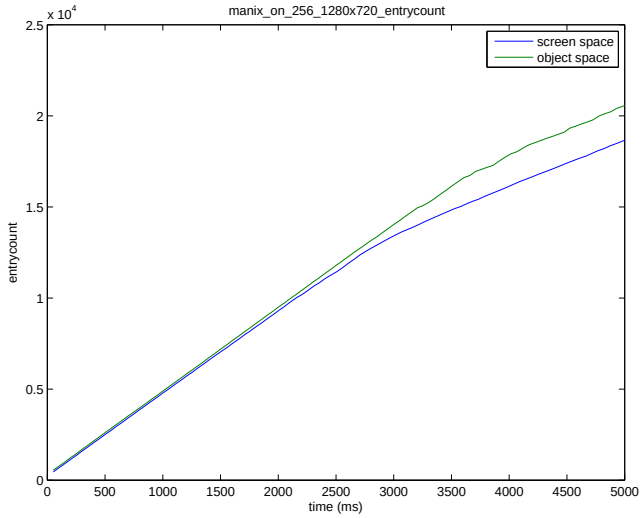


Figure 114: screen space vs object space: number of entries manix, background on, volume res = 256, screen res = 1280x720, entrycount

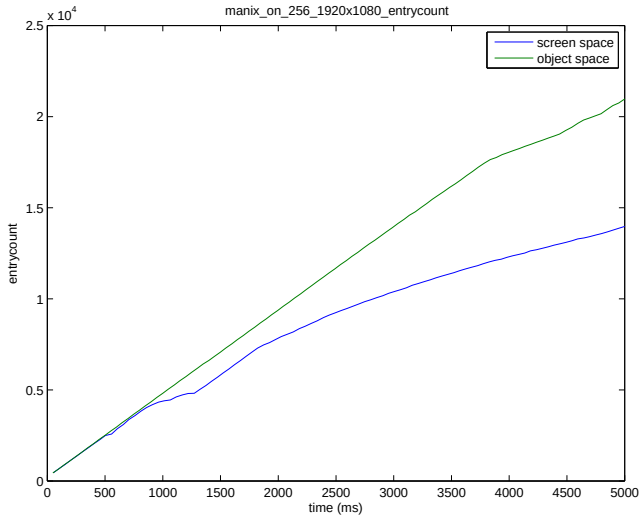


Figure 115: screen space vs object space: number of entries manix, background on, volume res = 256, screen res = 1920x1080, entrycount

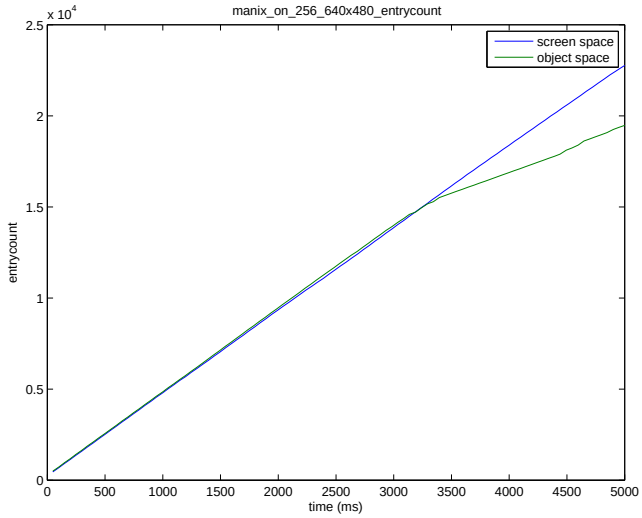


Figure 116: screen space vs object space: number of entries manix, background on, volume res = 256, screen res = 640x480, entrycount

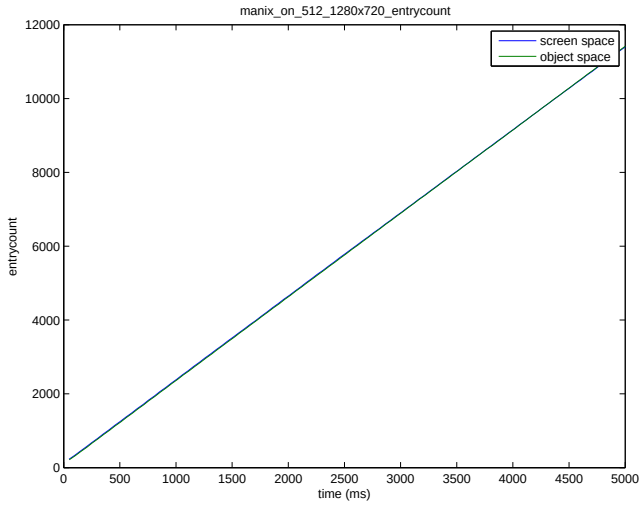


Figure 117: screen space vs object space: number of entries manix, background on, volume res = 512, screen res = 1280x720, entrycount

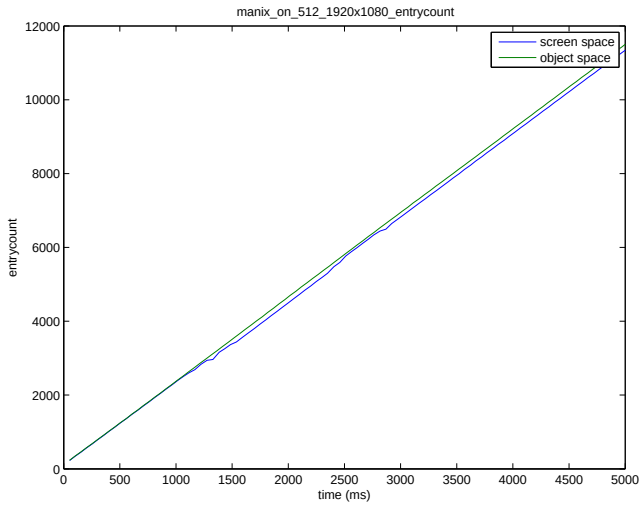


Figure 118: screen space vs object space: number of entries manix, background on, volume res = 512, screen res = 1920x1080, entrycount

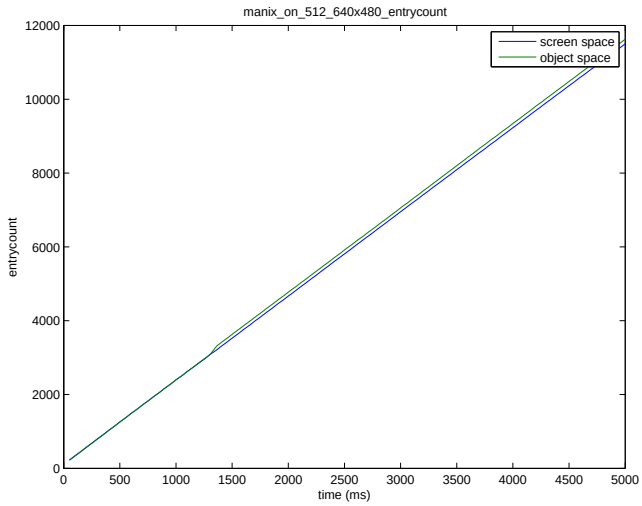


Figure 119: screen space vs object space: number of entries manix, background on, volume res = 512, screen res = 640x480, entrycount

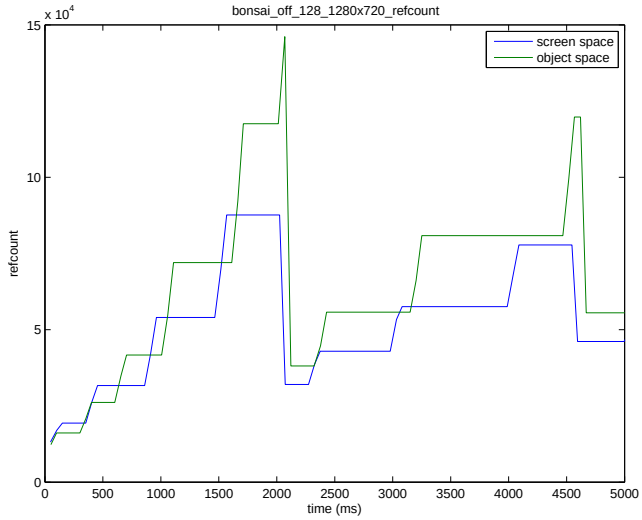


Figure 120: screen space vs object space: number of references bonsai, background off, volume res = 128, screen res = 1280x720, number of references

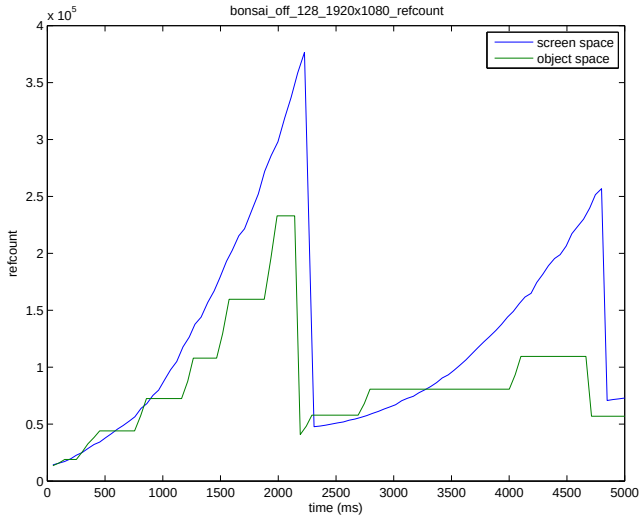


Figure 121: screen space vs object space: number of references bonsai, background off, volume res = 128, screen res = 1920x1080, number of references

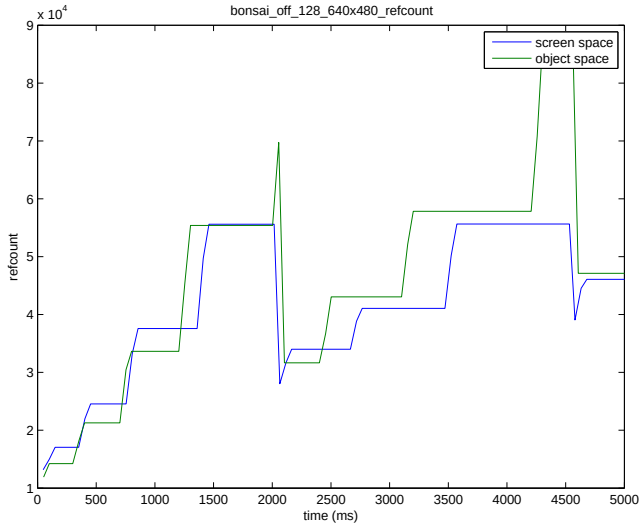


Figure 122: screen space vs object space: number of references bonsai, background off, volume res = 128, screen res = 640x480, number of references

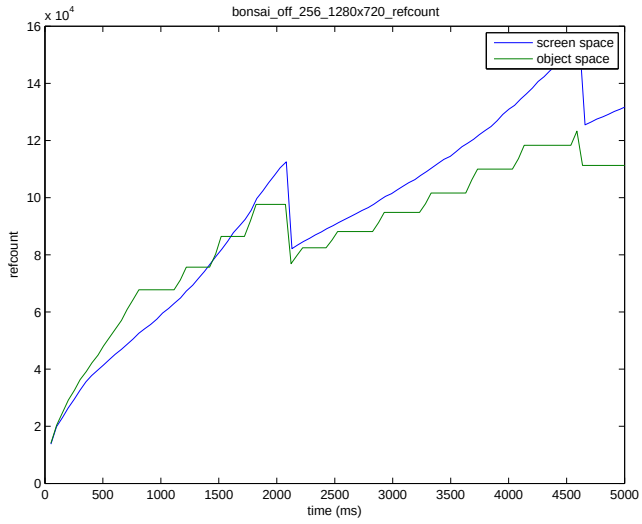


Figure 123: screen space vs object space: number of references bonsai, background off, volume res = 256, screen res = 1280x720, number of references

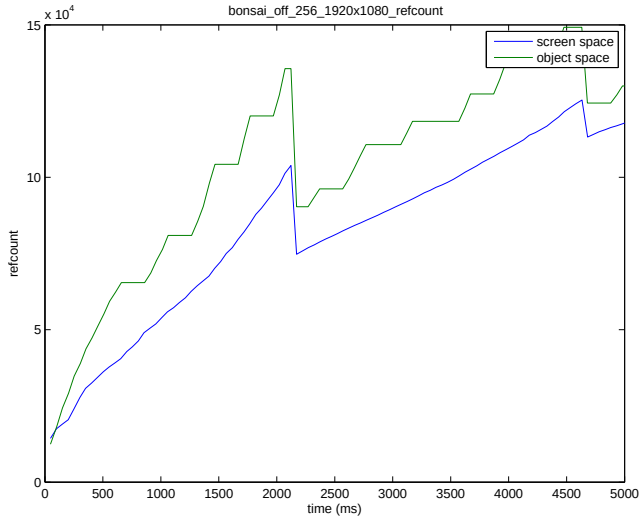


Figure 124: screen space vs object space: number of references bonsai, background off, volume res = 256, screen res = 1920x1080, number of references

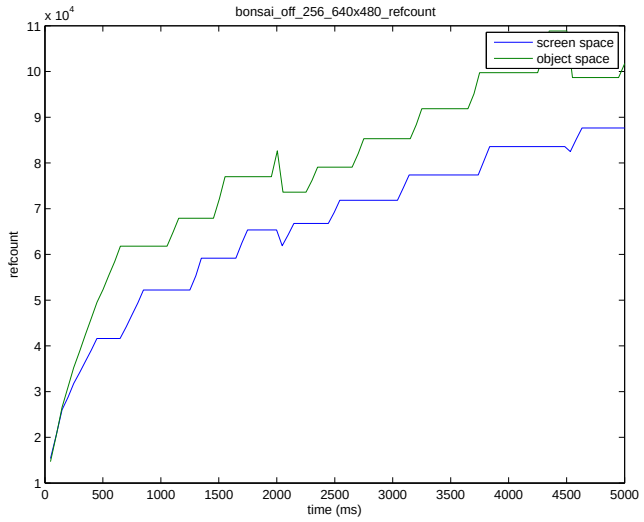


Figure 125: screen space vs object space: number of references bonsai, background off, volume res = 256, screen res = 640x480, number of references

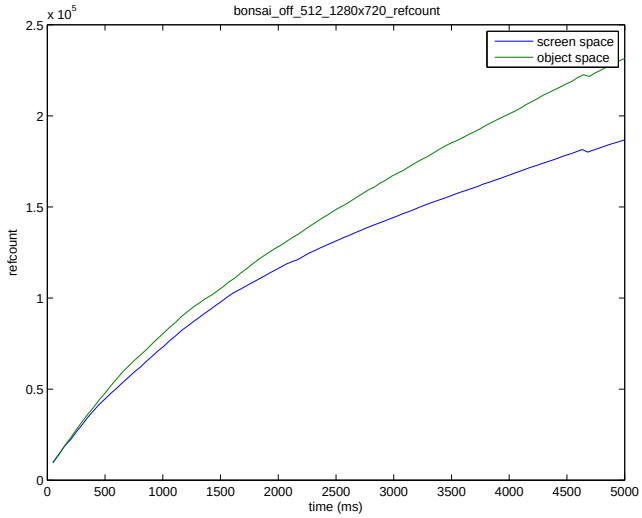


Figure 126: screen space vs object space: number of references bonsai, background off, volume res = 512, screen res = 1280x720, number of references

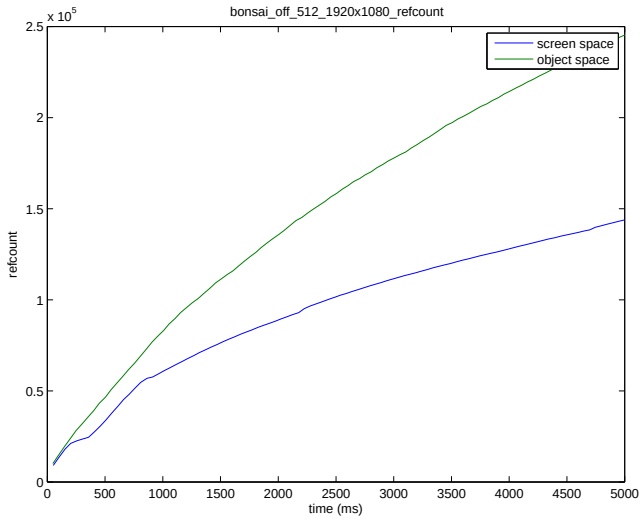


Figure 127: screen space vs object space: number of references bonsai, background off, volume res = 512, screen res = 1920x1080, number of references

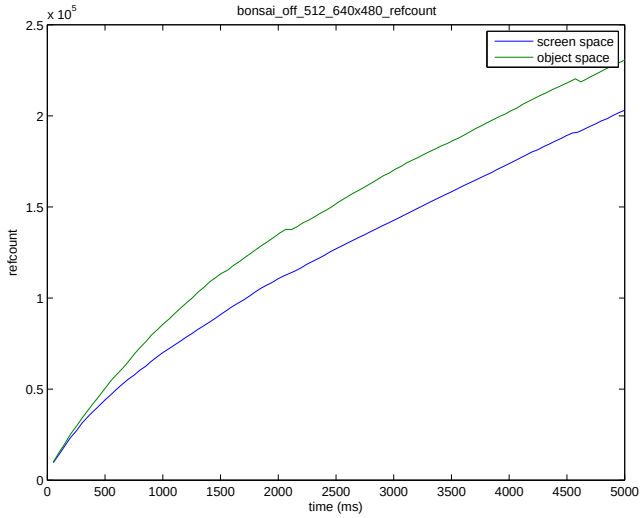


Figure 128: screen space vs object space: number of references bonsai, background off, volume res = 512, screen res = 640x480, number of references

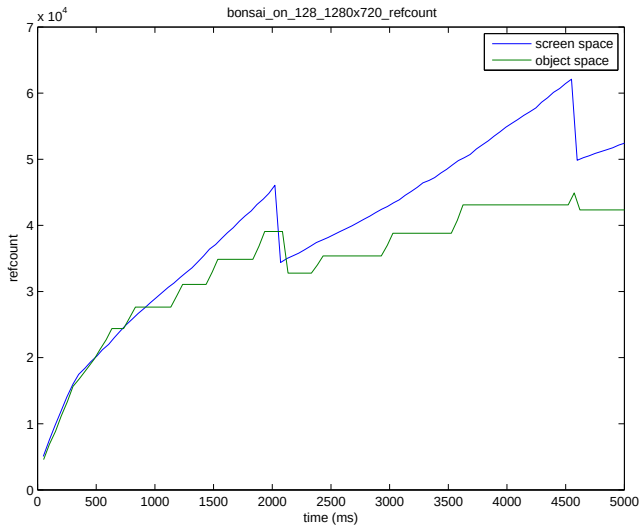


Figure 129: screen space vs object space: number of references bonsai, background on, volume res = 128, screen res = 1280x720, number of references

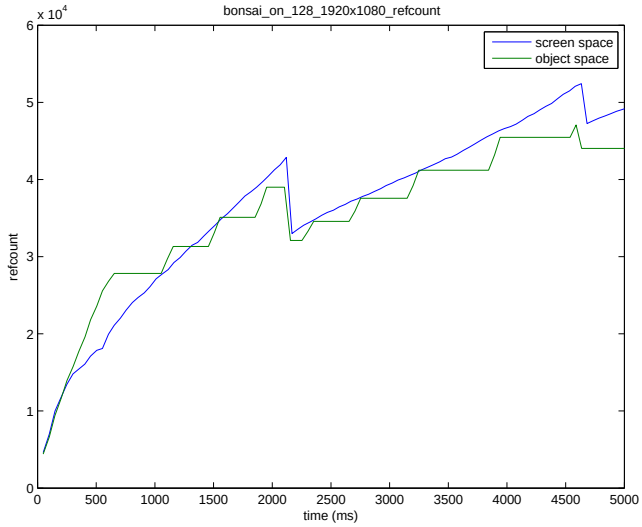


Figure 130: screen space vs object space: number of references bonsai, background on, volume res = 128, screen res = 1920x1080, number of references

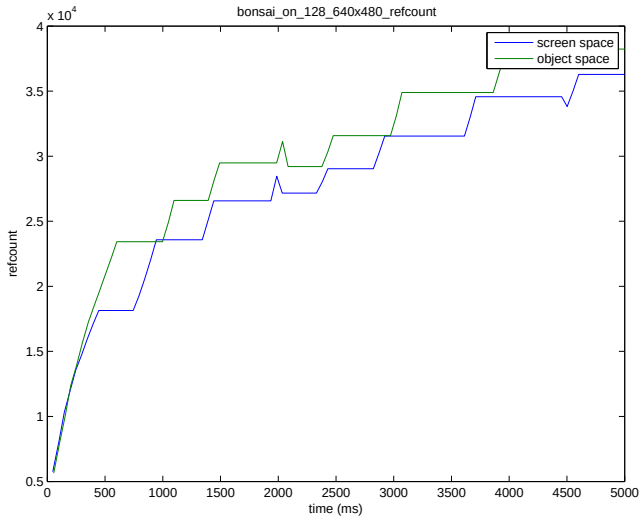


Figure 131: screen space vs object space: number of references bonsai, background on, volume res = 128, screen res = 640x480, number of references

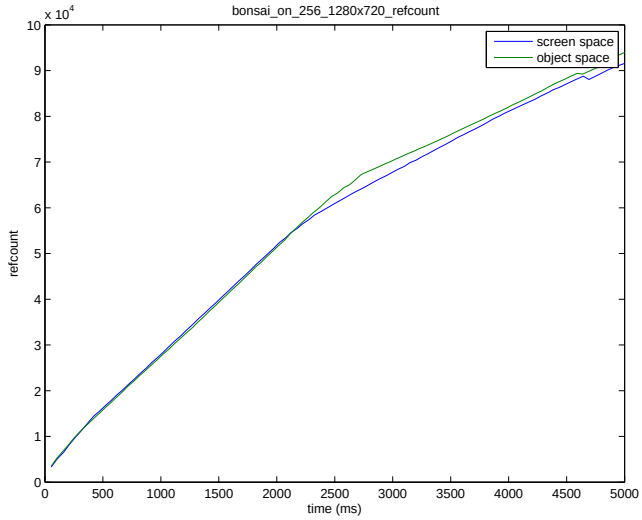


Figure 132: screen space vs object space: number of references bonsai, background on, volume res = 256, screen res = 1280x720, number of references

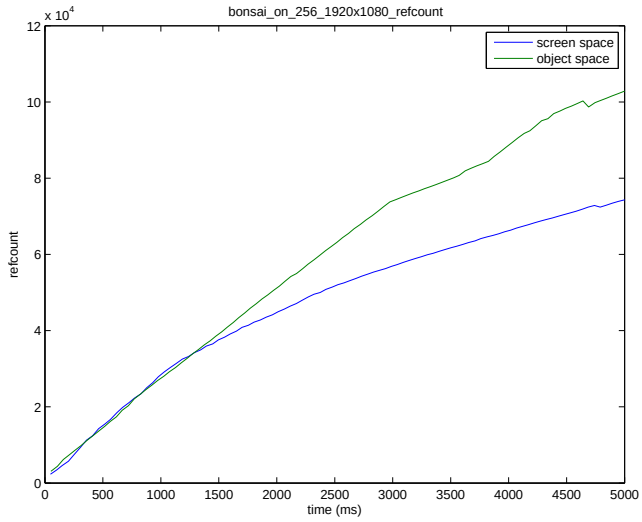


Figure 133: screen space vs object space: number of references bonsai, background on, volume res = 256, screen res = 1920x1080, number of references

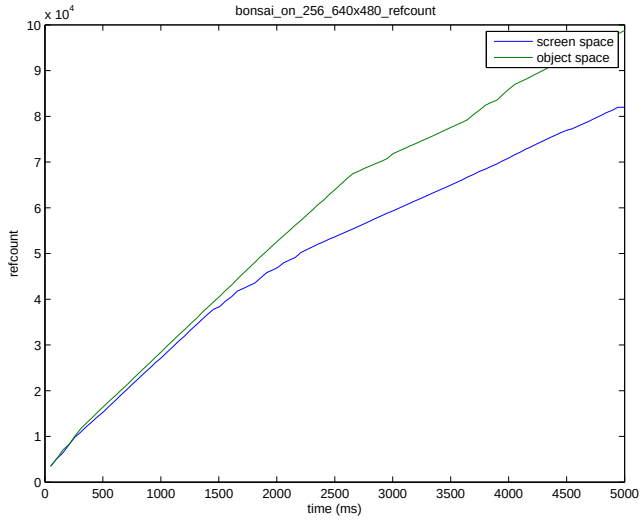


Figure 134: screen space vs object space: number of references bonsai, background on, volume res = 256, screen res = 640x480, number of references

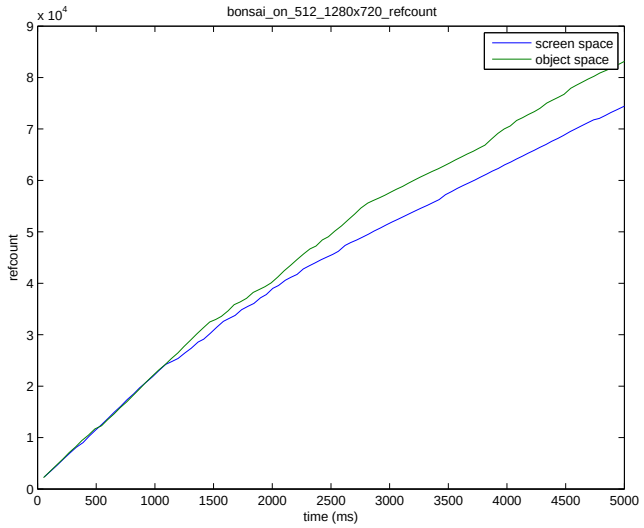


Figure 135: screen space vs object space: number of references bonsai, background on, volume res = 512, screen res = 1280x720, number of references

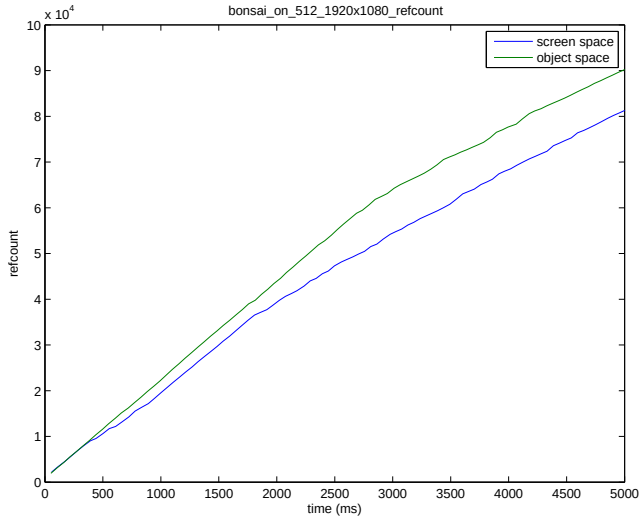


Figure 136: screen space vs object space: number of references bonsai, background on, volume res = 512, screen res = 1920x1080, number of references

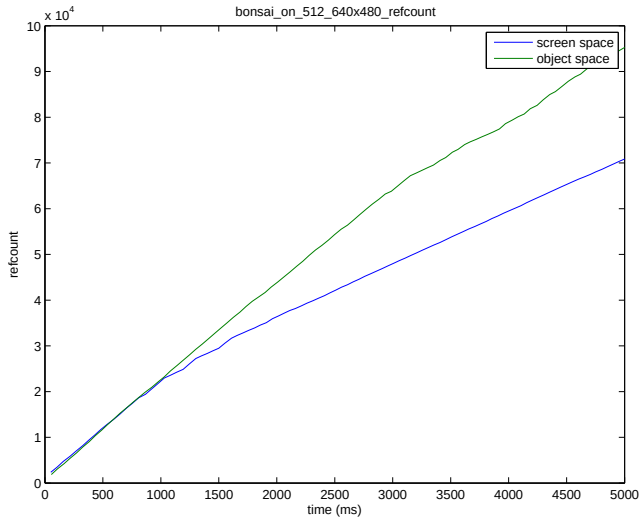


Figure 137: screen space vs object space: number of references bonsai, background on, volume res = 512, screen res = 640x480, number of references

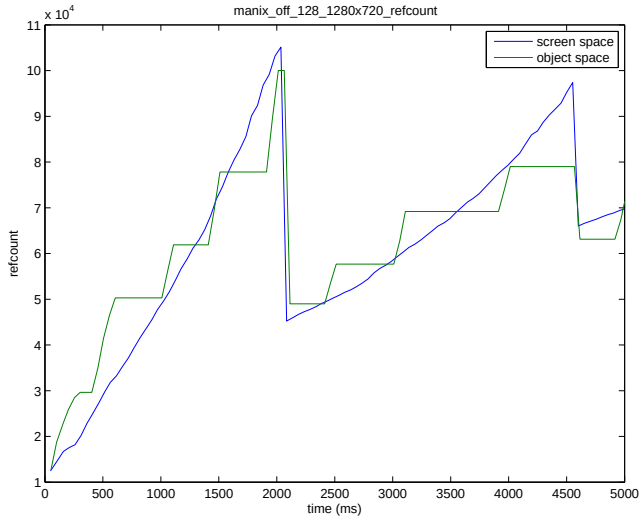


Figure 138: screen space vs object space: number of references manix, background off, volume res = 128, screen res = 1280x720, number of references

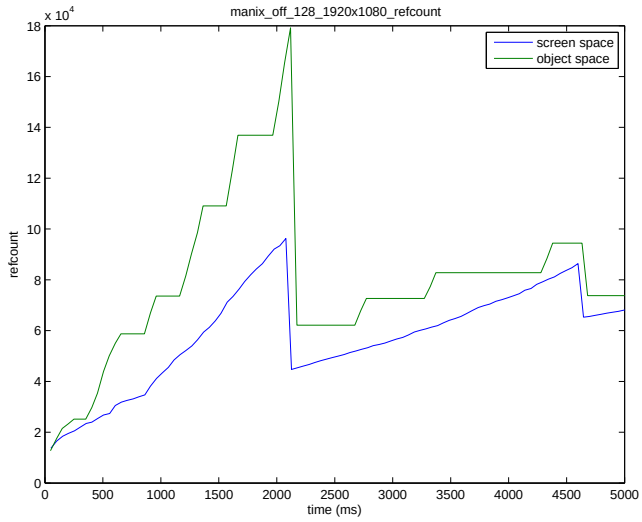


Figure 139: screen space vs object space: number of references manix, background off, volume res = 128, screen res = 1920x1080, number of references

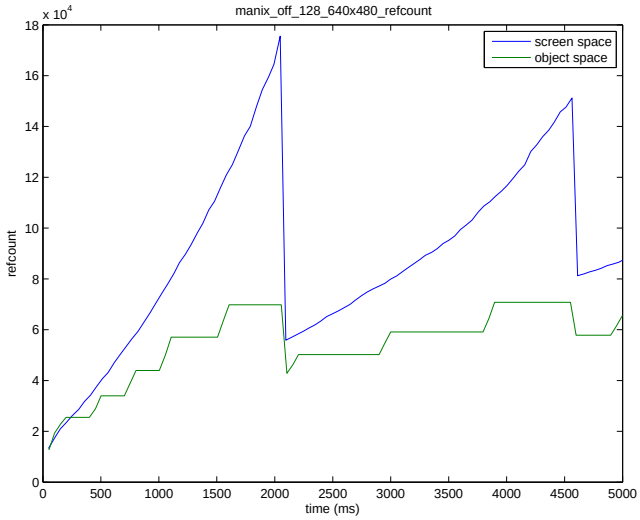


Figure 140: screen space vs object space: number of references manix, background off, volume res = 128, screen res = 640x480, number of references

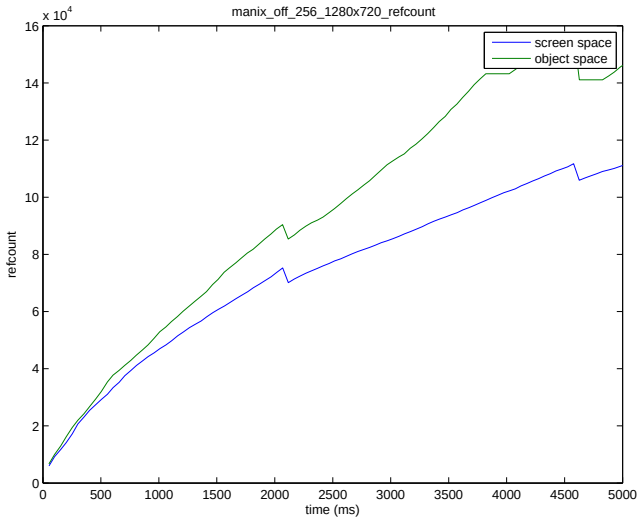


Figure 141: screen space vs object space: number of references manix, background off, volume res = 256, screen res = 1280x720, number of references

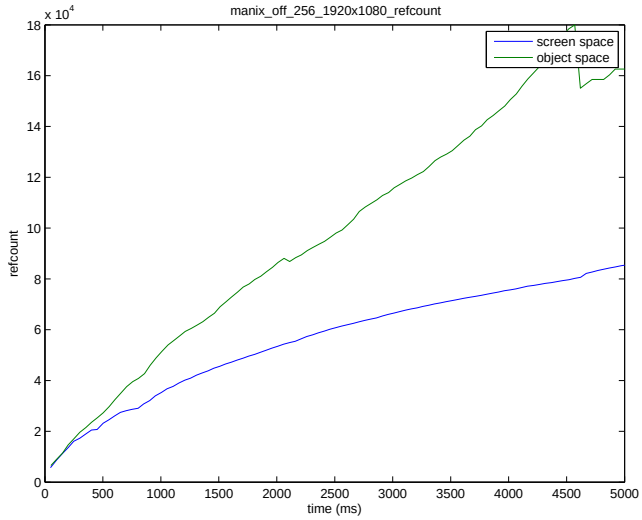


Figure 142: screen space vs object space: number of references manix, background off, volume res = 256, screen res = 1920x1080, number of references

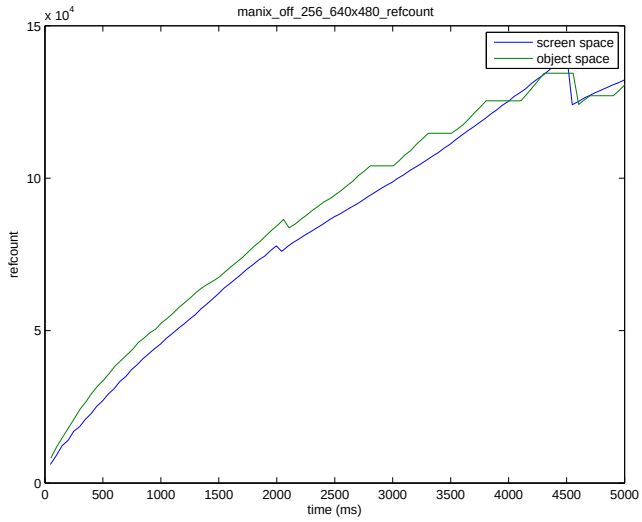


Figure 143: screen space vs object space: number of references manix, background off, volume res = 256, screen res = 640x480, number of references

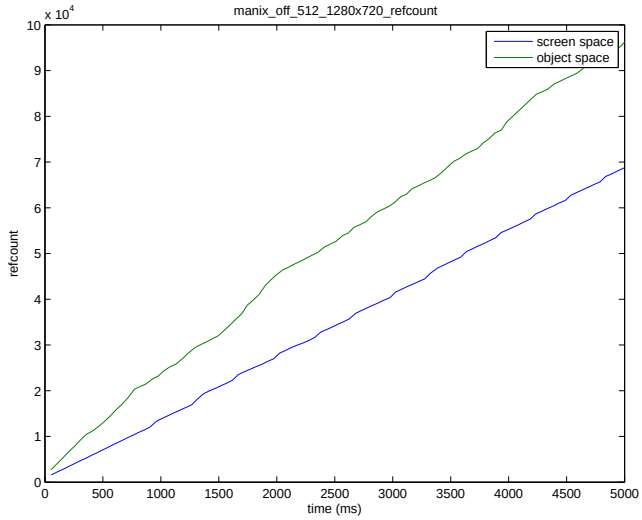


Figure 144: screen space vs object space: number of references manix, background off, volume res = 512, screen res = 1280x720, number of references

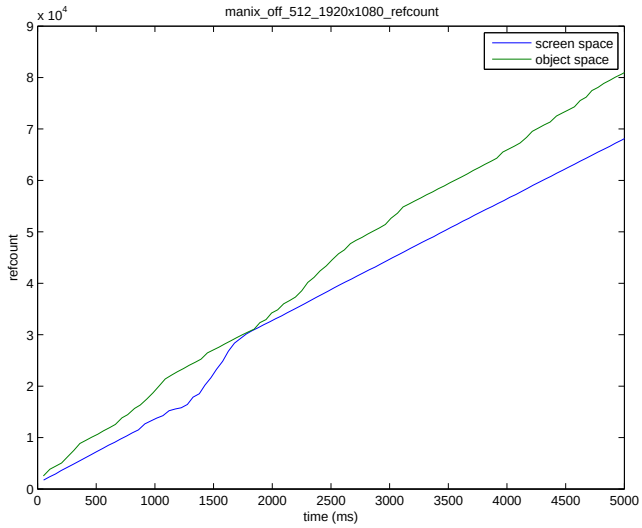


Figure 145: screen space vs object space: number of references manix, background off, volume res = 512, screen res = 1920x1080, number of references

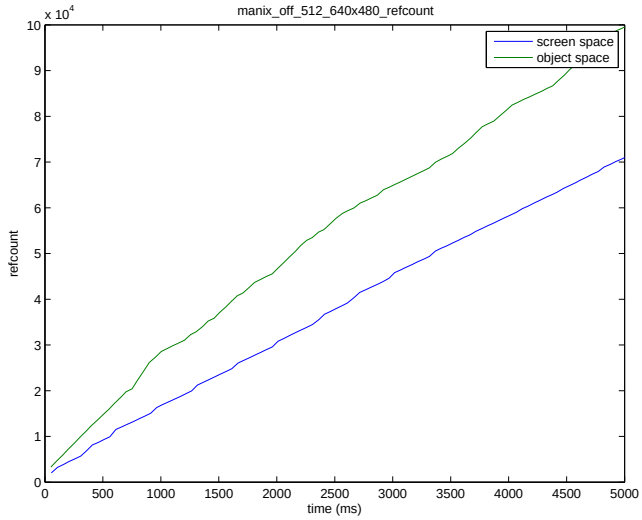


Figure 146: screen space vs object space: number of references manix, background off, volume res = 512, screen res = 640x480, number of references

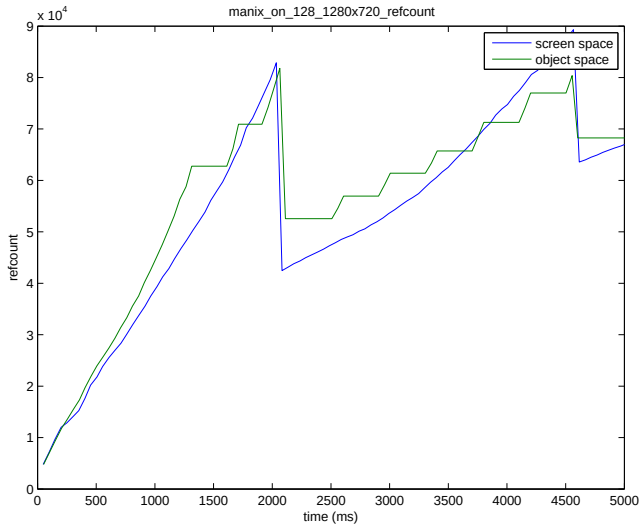


Figure 147: screen space vs object space: number of references manix, background on, volume res = 128, screen res = 1280x720, number of references

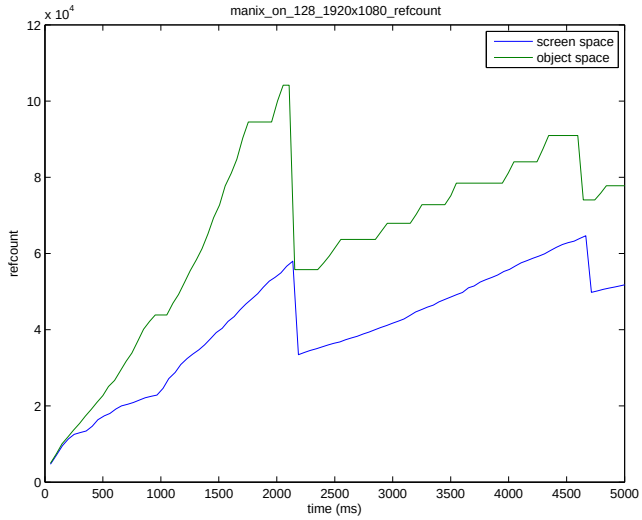


Figure 148: screen space vs object space: number of references manix, background on, volume res = 128, screen res = 1920x1080, number of references

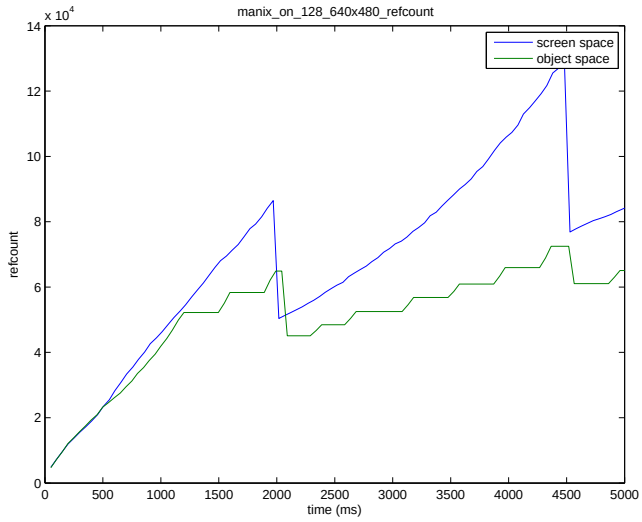


Figure 149: screen space vs object space: number of references manix, background on, volume res = 128, screen res = 640x480, number of references

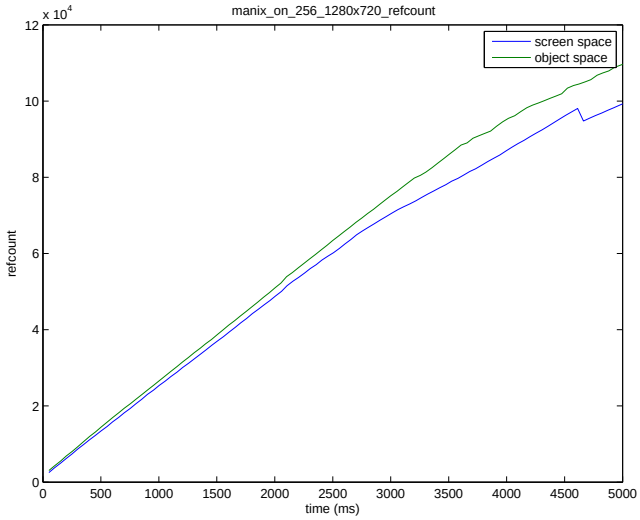


Figure 150: screen space vs object space: number of references manix, background on, volume res = 256, screen res = 1280x720, number of references

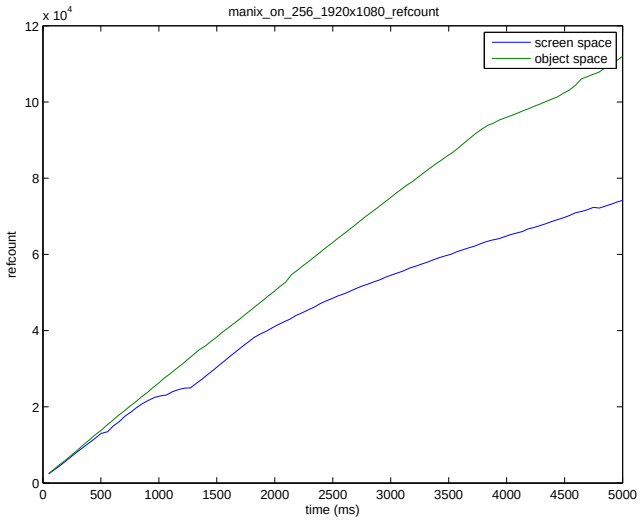


Figure 151: screen space vs object space: number of references manix, background on, volume res = 256, screen res = 1920x1080, number of references

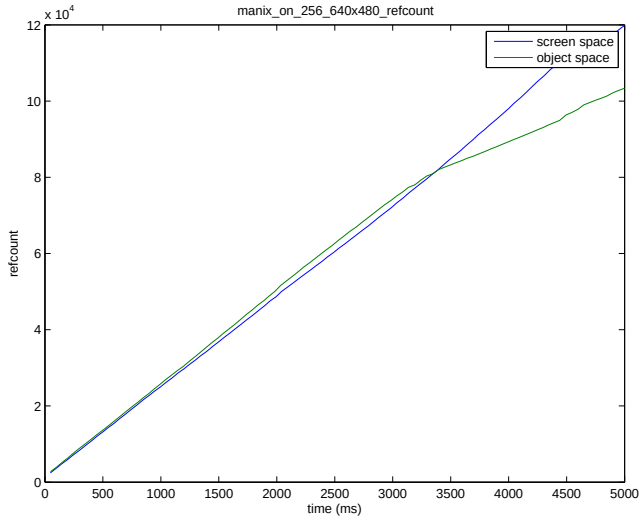


Figure 152: screen space vs object space: number of references manix, background on, volume res = 256, screen res = 640x480, number of references

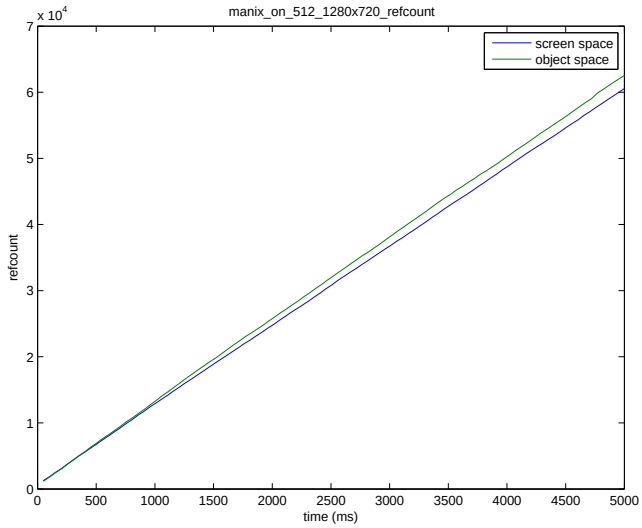


Figure 153: screen space vs object space: number of references manix, background on, volume res = 512, screen res = 1280x720, number of references

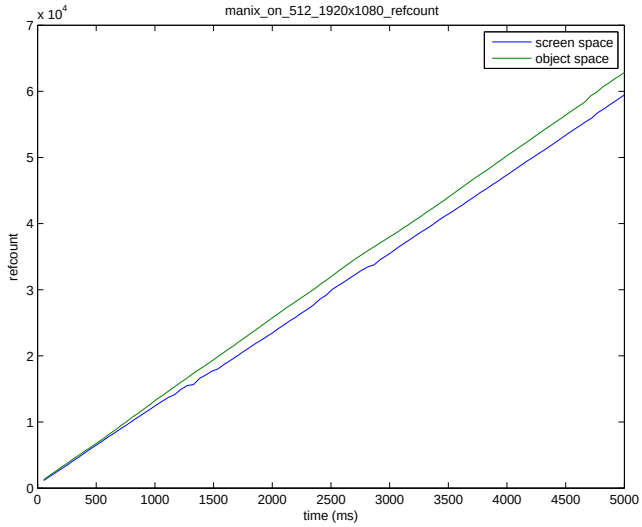


Figure 154: screen space vs object space: number of references manix, background on, volume res = 512, screen res = 1920x1080, number of references

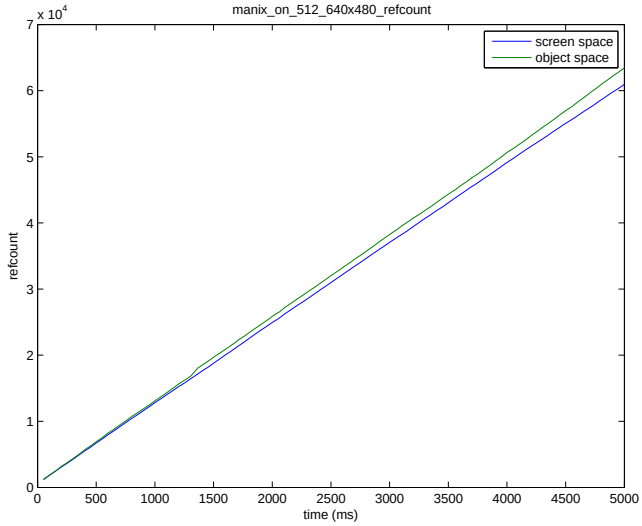


Figure 155: screen space vs object space: number of references manix, background on, volume res = 512, screen res = 640x480, number of references