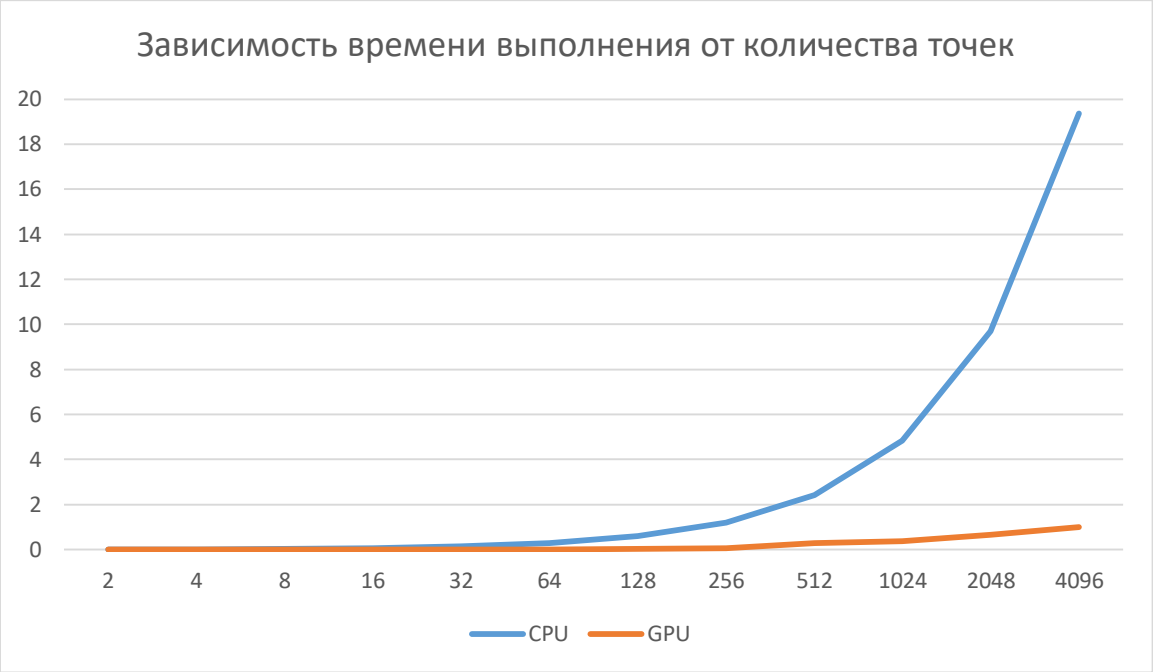
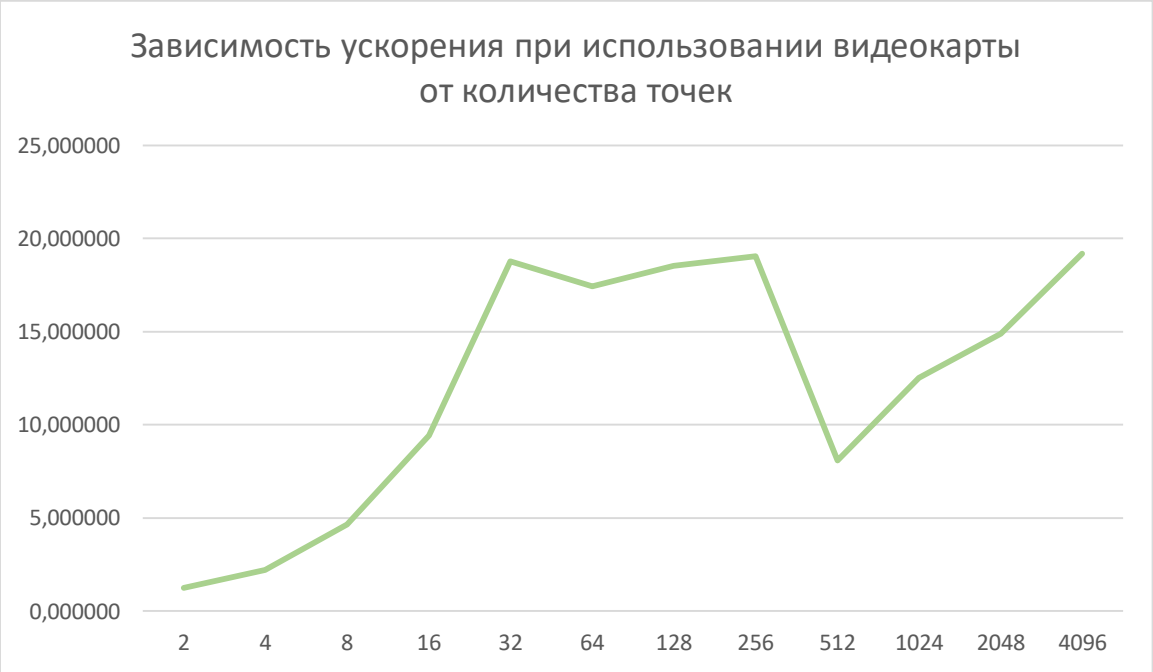
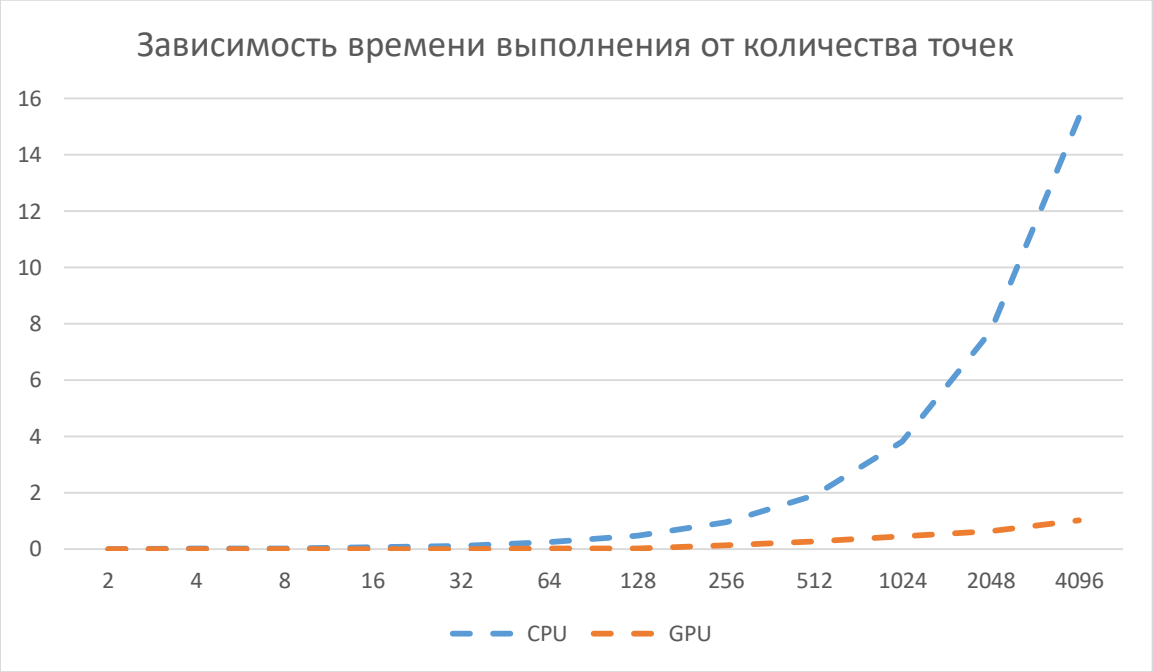
Расчетная область из 5120 треугольников

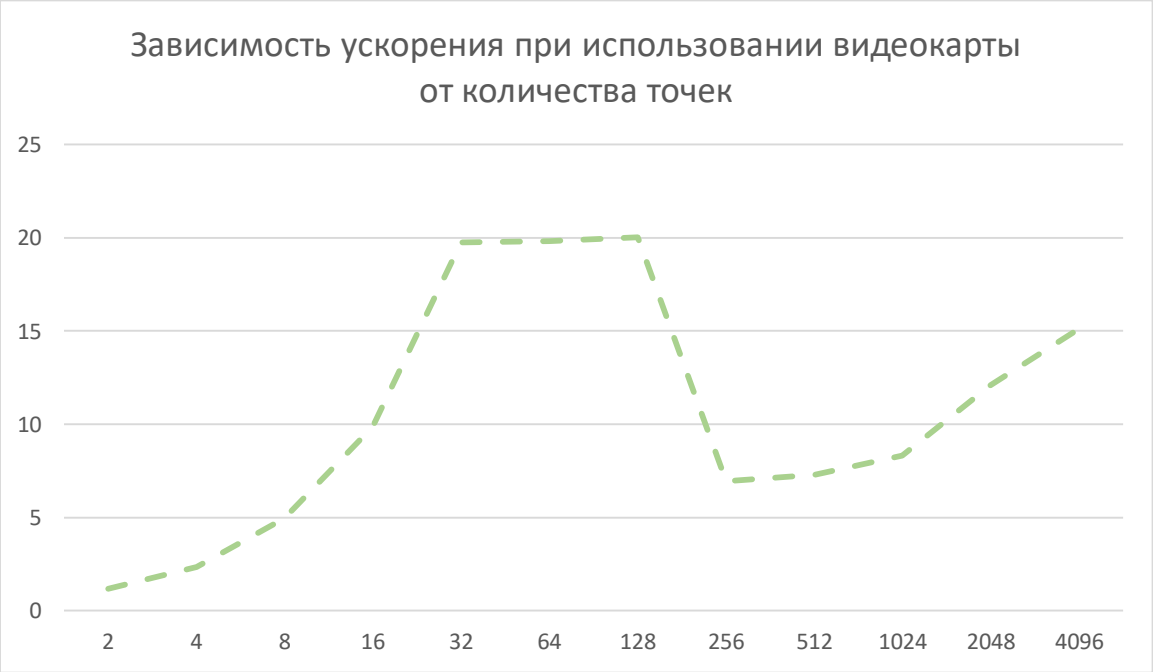
Реализация с хранением координат в отдельных массивах



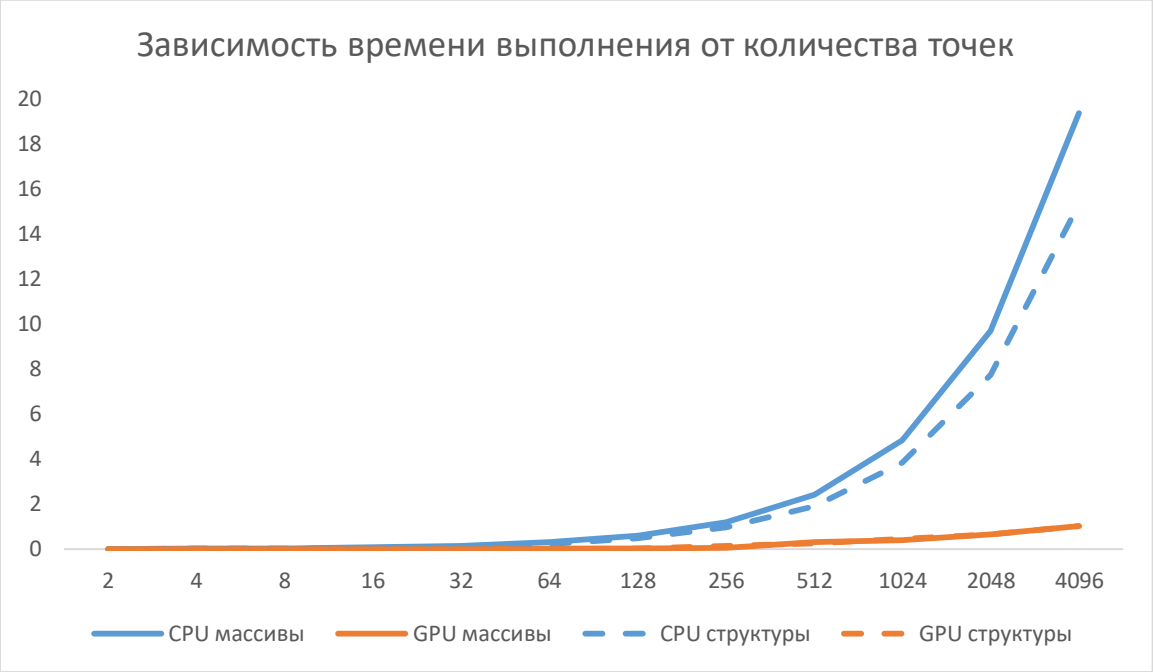


Реализация с хранением координат в массиве структур

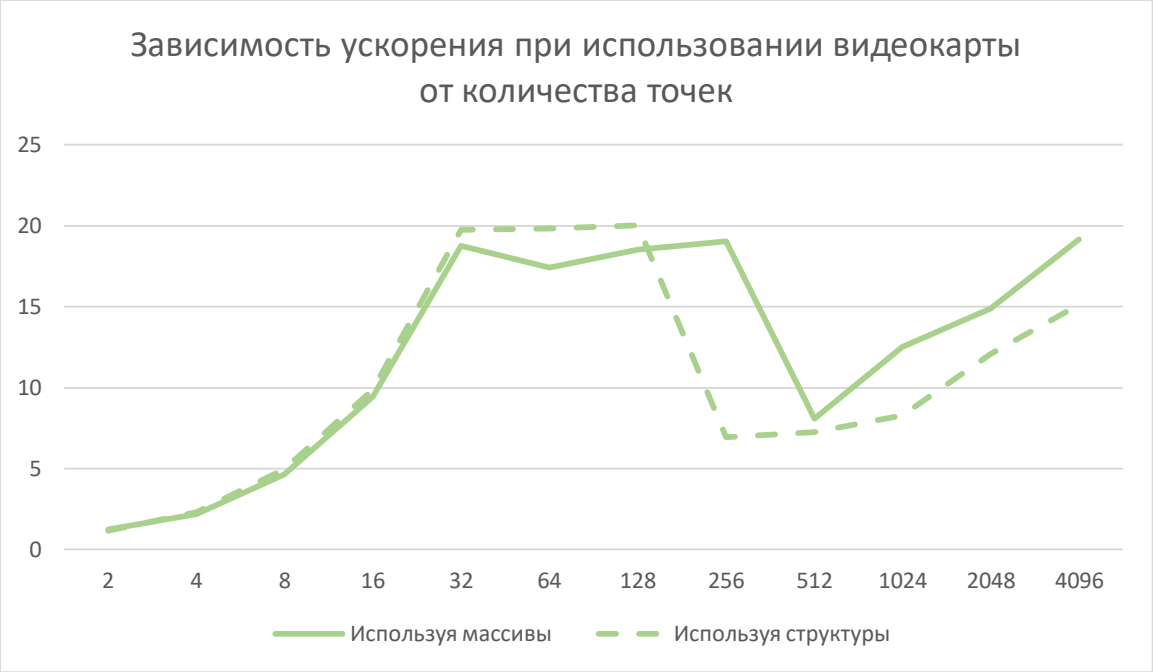




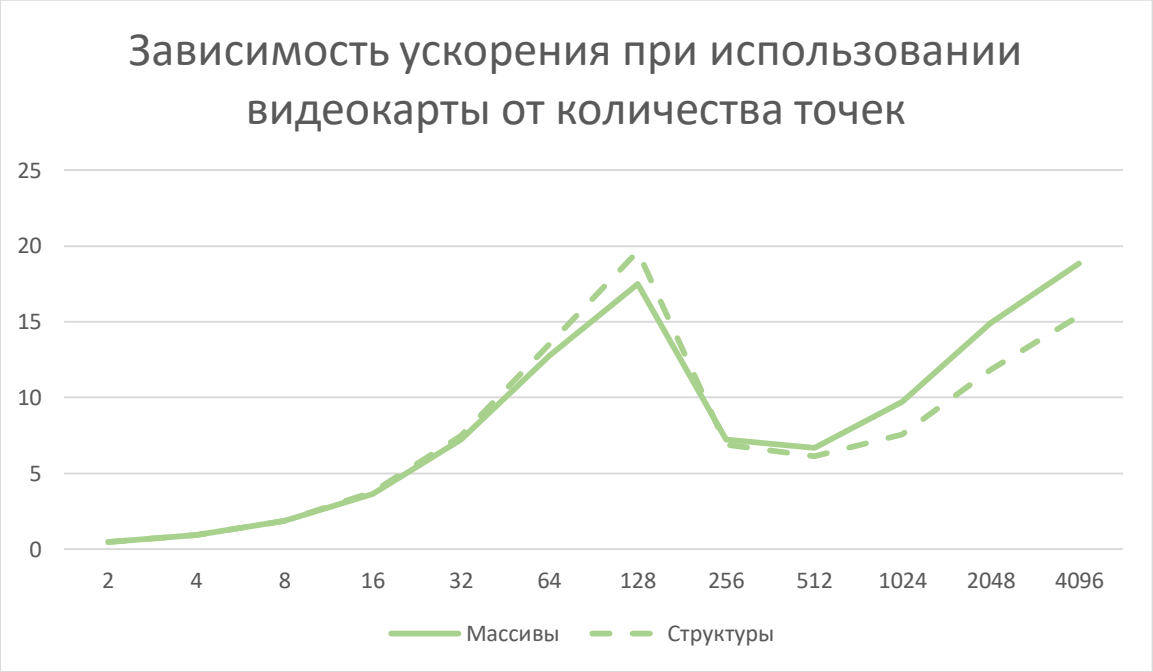
Сводные диаграммы



512 нитей на блок

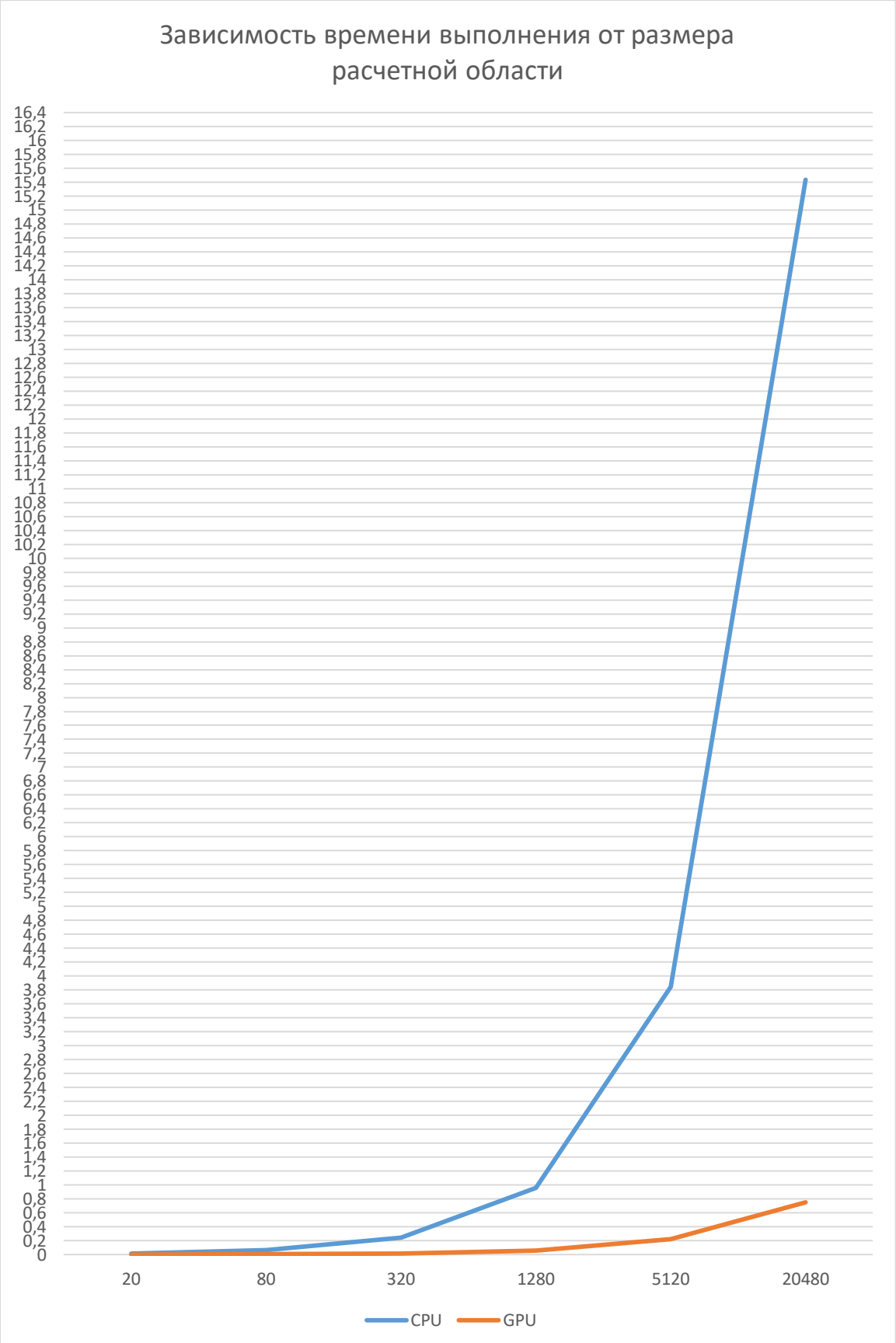


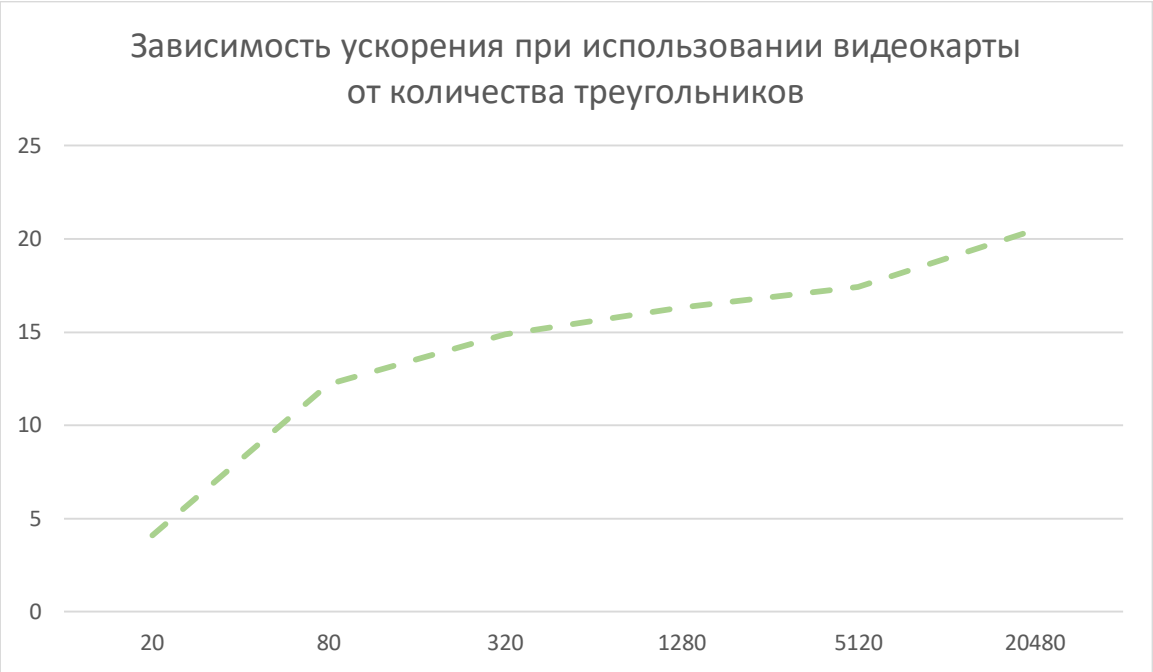
32 нити на блок



Использовался формат хранения с помощью структур

Количество точек = 1024




Зависимость ускорения при использовании видеокарты
от количества треугольников
25
20
15
10
5
0
20
80
320
1280
5120
20480

Пример результат выполнения программы:

```
Laplace solver with vector3s

                Points count:                 32
             Triangles count:               5120
            Quadrature order:                 64

       Preparing quadratures:        5.560000e-03
              Solving on CPU:        1.200420e-01

          Copying to device:        1.074100e-01
             Solving on GPU:        8.195872e-03
    Getting results from GPU:        6.900000e-05
              Total for GPU:        1.156749e-01

               GPU speedup:        1.464664e+01
                Total time:        2.412769e-01


----------------CPU results:---------------

       i          pointx          pointy          pointz            true            calc           error
       0    1.250000e-02    2.000000e-01    0.000000e+00       -0.039688       -0.039688    3.286960e-13
       1    2.500000e-02    2.000000e-01    0.000000e+00       -0.038750       -0.038750    3.550923e-13
       2    3.750000e-02    2.000000e-01    0.000000e+00       -0.037188       -0.037188    4.080769e-13
       3    5.000000e-02    2.000000e-01    0.000000e+00       -0.035000       -0.035000    4.036454e-13
       4    6.250000e-02    2.000000e-01    0.000000e+00       -0.032188       -0.032188    4.675871e-13
       5    7.500000e-02    2.000000e-01    0.000000e+00       -0.028750       -0.028750    5.081684e-13
       6    8.750000e-02    2.000000e-01    0.000000e+00       -0.024688       -0.024688    6.541884e-13
       7    1.000000e-01    2.000000e-01    0.000000e+00       -0.020000       -0.020000    8.142792e-13
       8    1.125000e-01    2.000000e-01    0.000000e+00       -0.014688       -0.014688    1.032271e-12
       9    1.250000e-01    2.000000e-01    0.000000e+00       -0.008750       -0.008750    1.807681e-12
      10    1.375000e-01    2.000000e-01    0.000000e+00       -0.002188       -0.002188    7.335997e-12
      11    1.500000e-01    2.000000e-01    0.000000e+00        0.005000        0.005000    3.392946e-12
      12    1.625000e-01    2.000000e-01    0.000000e+00        0.012812        0.012812    1.342287e-12
      13    1.750000e-01    2.000000e-01    0.000000e+00        0.021250        0.021250    8.207487e-13
      14    1.875000e-01    2.000000e-01    0.000000e+00        0.030312        0.030312    5.641535e-13
      15    2.000000e-01    2.000000e-01    0.000000e+00        0.040000        0.040000    4.206704e-13
      16    2.125000e-01    2.000000e-01    0.000000e+00        0.050313        0.050312    3.505822e-13
      17    2.250000e-01    2.000000e-01    0.000000e+00        0.061250        0.061250    2.776690e-13
      18    2.375000e-01    2.000000e-01    0.000000e+00        0.072813        0.072812    2.298591e-13
      19    2.500000e-01    2.000000e-01    0.000000e+00        0.085000        0.085000    1.941258e-13
      20    2.625000e-01    2.000000e-01    0.000000e+00        0.097812        0.097812    1.708254e-13
      21    2.750000e-01    2.000000e-01    0.000000e+00        0.111250        0.111250    1.490693e-13
      22    2.875000e-01    2.000000e-01    0.000000e+00        0.125313        0.125312    1.295722e-13
      23    3.000000e-01    2.000000e-01    0.000000e+00        0.140000        0.140000    1.100310e-13
      24    3.125000e-01    2.000000e-01    0.000000e+00        0.155312        0.155312    1.016848e-13
      25    3.250000e-01    2.000000e-01    0.000000e+00        0.171250        0.171250    8.395555e-14
      26    3.375000e-01    2.000000e-01    0.000000e+00        0.187813        0.187812    7.699517e-14
      27    3.500000e-01    2.000000e-01    0.000000e+00        0.205000        0.205000    6.282238e-14
      28    3.625000e-01    2.000000e-01    0.000000e+00        0.222813        0.222812    6.004236e-14
      29    3.750000e-01    2.000000e-01    0.000000e+00        0.241250        0.241250    5.338274e-14
      30    3.875000e-01    2.000000e-01    0.000000e+00        0.260313        0.260312    3.945090e-14
      31    4.000000e-01    2.000000e-01    0.000000e+00        0.280000        0.280000    3.568574e-14

----------------GPU results:---------------

       i          pointx          pointy          pointz            true            calc           error
       0    1.250000e-02    2.000000e-01    0.000000e+00       -0.039688       -0.039688    3.349901e-13
```

1	2.500000e-02	2.000000e-01	0.000000e+00	-0.038750	-0.038750	3.534807e-13
2	3.750000e-02	2.000000e-01	0.000000e+00	-0.037188	-0.037188	3.793417e-13
3	5.000000e-02	2.000000e-01	0.000000e+00	-0.035000	-0.035000	4.137563e-13
4	6.250000e-02	2.000000e-01	0.000000e+00	-0.032188	-0.032188	4.617665e-13
5	7.500000e-02	2.000000e-01	0.000000e+00	-0.028750	-0.028750	5.290454e-13
6	8.750000e-02	2.000000e-01	0.000000e+00	-0.024688	-0.024688	6.286111e-13
7	1.000000e-01	2.000000e-01	0.000000e+00	-0.020000	-0.020000	7.927686e-13
8	1.125000e-01	2.000000e-01	0.000000e+00	-0.014688	-0.014688	1.095459e-12
9	1.250000e-01	2.000000e-01	0.000000e+00	-0.008750	-0.008750	1.870726e-12
10	1.375000e-01	2.000000e-01	0.000000e+00	-0.002188	-0.002188	7.584211e-12
11	1.500000e-01	2.000000e-01	0.000000e+00	0.005000	0.005000	3.356170e-12
12	1.625000e-01	2.000000e-01	0.000000e+00	0.012812	0.012812	1.325633e-12
13	1.750000e-01	2.000000e-01	0.000000e+00	0.021250	0.021250	8.024627e-13
14	1.875000e-01	2.000000e-01	0.000000e+00	0.030312	0.030312	5.670149e-13
15	2.000000e-01	2.000000e-01	0.000000e+00	0.040000	0.040000	4.312523e-13
16	2.125000e-01	2.000000e-01	0.000000e+00	0.050313	0.050312	3.428589e-13
17	2.250000e-01	2.000000e-01	0.000000e+00	0.061250	0.061250	2.820873e-13
18	2.375000e-01	2.000000e-01	0.000000e+00	0.072813	0.072812	2.348146e-13
19	2.500000e-01	2.000000e-01	0.000000e+00	0.085000	0.085000	2.003299e-13
20	2.625000e-01	2.000000e-01	0.000000e+00	0.097812	0.097812	1.721023e-13
21	2.750000e-01	2.000000e-01	0.000000e+00	0.111250	0.111250	1.491940e-13
22	2.875000e-01	2.000000e-01	0.000000e+00	0.125313	0.125312	1.300151e-13
23	3.000000e-01	2.000000e-01	0.000000e+00	0.140000	0.140000	1.137979e-13
24	3.125000e-01	2.000000e-01	0.000000e+00	0.155312	0.155312	9.971903e-14
25	3.250000e-01	2.000000e-01	0.000000e+00	0.171250	0.171250	8.735915e-14
26	3.375000e-01	2.000000e-01	0.000000e+00	0.187813	0.187812	7.640403e-14
27	3.500000e-01	2.000000e-01	0.000000e+00	0.205000	0.205000	6.674877e-14
28	3.625000e-01	2.000000e-01	0.000000e+00	0.222813	0.222812	5.767554e-14
29	3.750000e-01	2.000000e-01	0.000000e+00	0.241250	0.241250	4.970118e-14
30	3.875000e-01	2.000000e-01	0.000000e+00	0.260313	0.260312	4.243638e-14
31	4.000000e-01	2.000000e-01	0.000000e+00	0.280000	0.280000	3.509098e-14