Starting CPU vs. GPU interpolation benchmarks:

Testing with 1000 random points:

test\_interpolation.exe (52664): Loaded 'C:\Windows\System32\bcryptprimitives.dll'.

Thread 0: lon = -179.896899, lat = 29.509190

Thread 0: Query lon=-179.896899, lat=29.509190

Neighbor 0: index=(20, 3041), value=-11.000200, dist=0.503083, coords=(-179.897474, 29.507659)

Neighbor 1: index=(21, 3041), value=-11.050300, dist=1.011513, coords=(-179.892473, 29.507659)

Neighbor 2: index=(21, 3042), value=-11.050300, dist=1.021577, coords=(-179.892473, 29.510785)

Neighbor 3: index=(20, 3043), value=-11.000200, dist=1.514599, coords=(-179.897474, 29.513911)

CPU Bilinear: 0 ms

CPU Cubic: 0 ms

CPU Kriging: 5 ms

GPU Bilinear: 10 ms

GPU Cubic: 2 ms

GPU Kriging: 21 ms

Bilinear result validation: PASSED

Cubic result validation: PASSED

Kriging result validation: PASSED

Testing with 5000 random points:

Thread 0: lon = -173.308135, lat = 26.771416

Thread 0: Query lon=-173.308135, lat=26.771416

Neighbor 0: index=(1338, 2166), value=-75.840600, dist=0.564005, coords=(-173.305826, 26.772429)

Neighbor 1: index=(1338, 2165), value=-75.837900, dist=0.818414, coords=(-173.305826, 26.769303)

Neighbor 2: index=(1337, 2165), value=-75.792900, dist=0.864119, coords=(-173.310828, 26.769303)

Neighbor 3: index=(1338, 2167), value=-75.843200, dist=1.402285, coords=(-173.305826, 26.775555)

CPU Bilinear: 0 ms

CPU Cubic: 3 ms

CPU Kriging: 15 ms

GPU Bilinear: 2 ms

GPU Cubic: 3 ms

GPU Kriging: 9 ms

Bilinear result validation: PASSED

Cubic result validation: PASSED

Kriging result validation: PASSED

Testing with 10000 random points:

Thread 0: lon = -165.872270, lat = 24.451604

Thread 0: Query lon=-165.872270, lat=24.451604

Neighbor 0: index=(2824, 1423), value=-61.681000, dist=0.661921, coords=(-165.873968, 24.449828)

Neighbor 1: index=(2825, 1424), value=-61.619000, dist=0.789074, coords=(-165.868967, 24.452954)

Neighbor 2: index=(2825, 1423), value=-61.687500, dist=0.871211, coords=(-165.868967, 24.449828)

Neighbor 3: index=(2824, 1425), value=-61.544400, dist=1.471529, coords=(-165.873968, 24.456080)

CPU Bilinear: 2 ms

CPU Cubic: 8 ms

CPU Kriging: 38 ms

GPU Bilinear: 3 ms

GPU Cubic: 7 ms

GPU Kriging: 17 ms

Bilinear result validation: PASSED

Cubic result validation: PASSED

Kriging result validation: PASSED

Testing with 50000 random points:

Thread 0: lon = -178.610837, lat = 26.484890

Thread 0: Query lon=-178.610837, lat=26.484890

Neighbor 0: index=(277, 2074), value=-23.851400, dist=0.263736, coords=(-178.612153, 26.484839)

Neighbor 1: index=(278, 2074), value=-23.901400, dist=0.736942, coords=(-178.607152, 26.484839)

Neighbor 2: index=(278, 2075), value=-23.901400, dist=1.229086, coords=(-178.607152, 26.487965)

Neighbor 3: index=(279, 2074), value=-23.951400, dist=1.736839, coords=(-178.602151, 26.484839)

CPU Bilinear: 8 ms

CPU Cubic: 41 ms

CPU Kriging: 147 ms

GPU Bilinear: 10 ms

GPU Cubic: 32 ms

GPU Kriging: 73 ms

Bilinear result validation: PASSED

Cubic result validation: PASSED

Kriging result validation: PASSED

Testing with 100000 random points:

Thread 0: lon = -168.085992, lat = 27.404707

Thread 0: Query lon=-168.085992, lat=27.404707

Neighbor 0: index=(2382, 2368), value=-112.795000, dist=0.396528, coords=(-168.084521, 27.403876)

Neighbor 1: index=(2381, 2368), value=-112.773000, dist=0.754218, coords=(-168.089522, 27.403876)

Neighbor 2: index=(2382, 2369), value=-112.850000, dist=0.790889, coords=(-168.084521, 27.407002)

Neighbor 3: index=(2383, 2368), value=-112.817000, dist=1.321220, coords=(-168.079520, 27.403876)

CPU Bilinear: 16 ms

CPU Cubic: 81 ms

CPU Kriging: 307 ms

GPU Bilinear: 20 ms

GPU Cubic: 64 ms

GPU Kriging: 142 ms

Bilinear result validation: PASSED

Cubic result validation: PASSED

Kriging result validation: PASSED

Testing with 1000000 random points:

Thread 0: lon = -160.697468, lat = 22.421648

Thread 0: Query lon=-160.697468, lat=22.421648

Neighbor 0: index=(3859, 774), value=-194.846000, dist=0.189628, coords=(-160.697674, 22.421069)

Neighbor 1: index=(3860, 774), value=-194.916000, dist=0.976486, coords=(-160.692673, 22.421069)

Neighbor 2: index=(3860, 775), value=-194.887000, dist=1.258307, coords=(-160.692673, 22.424195)

Neighbor 3: index=(3859, 776), value=-194.788000, dist=1.815373, coords=(-160.697674, 22.427321)

CPU Bilinear: 166 ms

CPU Cubic: 794 ms

CPU Kriging: 3068 ms

GPU Bilinear: 178 ms

GPU Cubic: 627 ms

GPU Kriging: 1388 ms

Bilinear result validation: PASSED

Cubic result validation: PASSED

Kriging result validation: PASSED

Testing with 5000000 random points:

Thread 0: lon = -173.767201, lat = 21.751256

Thread 0: Query lon=-173.767201, lat=21.751256

Neighbor 0: index=(1246, 560), value=-72.181900, dist=0.371553, coords=(-173.765941, 21.752110)

Neighbor 1: index=(1246, 559), value=-72.182600, dist=0.769305, coords=(-173.765941, 21.748984)

Neighbor 2: index=(1245, 559), value=-72.133200, dist=1.043071, coords=(-173.770943, 21.748984)

Neighbor 3: index=(1246, 561), value=-72.181300, dist=1.297795, coords=(-173.765941, 21.755236)

CPU Bilinear: 823 ms

CPU Cubic: 4001 ms

CPU Kriging: 16670 ms

GPU Bilinear: 880 ms

GPU Cubic: 3113 ms

GPU Kriging: 6918 ms

Bilinear result validation: PASSED

Cubic result validation: PASSED

Kriging result validation: PASSED