

Case	Resolution (Width x Height)	Number of Frames	Serial time (s)	Parallel time double (s)	Parallel time float (s)
1	640 x 360	10	1.0946	0.0493	0.001
2	960 x 540	15	3.6917	0.1484	0
3	1280 x 720	20	8.5457	0.3472	0
4	1600 x 900	25	17.0133	0.6635	0
5	1920 x 1080	30	29.1958	1.1208	0
6	2560 x 1440	35	58.9057	2.1778	0
7	3200 x 1800	40	Takes too long	4.0486	0
8	3840 x 2160	50	Takes too long	6.0850	0.003
9	4096 x 2160	55	Takes too long	6.9168	0.012
10	4096 x 2160	60	Takes too long	6.7505	0.123

Extra Credit

The float CUDA program is significantly faster than the double program due to hardware optimizations on GPUs for single-precision arithmetic. Floats use less memory (4 bytes compared to 8 bytes for doubles), which reduces memory bandwidth usage and improves cache efficiency. Additionally, float operations are simpler and require fewer computational steps, allowing GPUs to execute more instructions per cycle and maintain higher parallelism. As a result, the float program is better suited for tasks like fractal generation, where extreme precision is unnecessary, and performance is a priority.