

## Analysis Report for PA5

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### Serial runtimes:

Radius \ Size	1920x1080	3840x2160
0	0.1800 sec	0.7300 sec
10	28.41 sec	114.0 sec
20	106.9 sec	431.1 sec
40	416.1	1680 sec

### GPU runtimes:

Radius \ Size	1920x1079 (# of threads)	3840x2160 (# of threads)
0	0.0300 sec (2088960)	0.0500 sec (8355840)
10	0.2000 sec (2088960)	0.8100 sec (8355840)
20	0.7600 sec (2088960)	3.060 sec (8355840)
40	2.960 sec (2088960)	11.82 sec (8355840)

### Speedup (serial time / parallel time):

Radius \ Size	1920x1079	3840x2160
0	6	14.6
10	142	142.5
20	140.7	140.9
40	140.6	142.1

### Efficiency (speedup / total # of threads):

Radius \ Size	1920x1079	3840x2160
0	2.872e-6	1.747e-6
10	6.798e-5	1.705e-5
20	6.735e-5	1.686e-6
40	6.731e-5	1.701e-6

We believe our program is efficient and strongly scalable because the speedup and efficiency remain constant as we increase the radius (increased computation). Even when the image size is increased, we still get a speedup of approximately 140.