1 Python Plots

Fig. 1

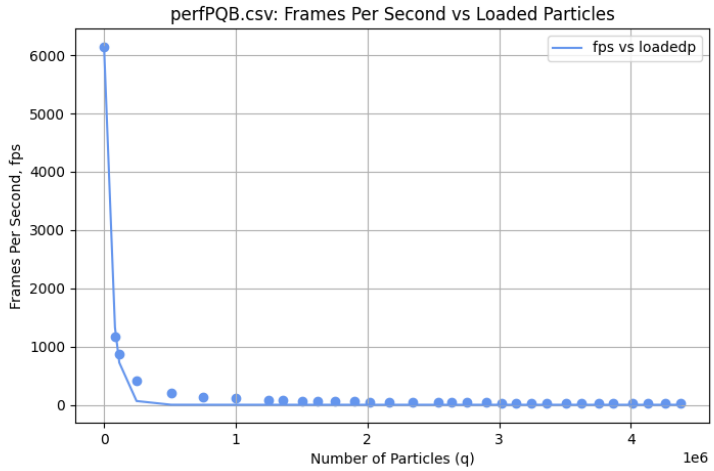

Figure 1: *fps*

Fig. 2

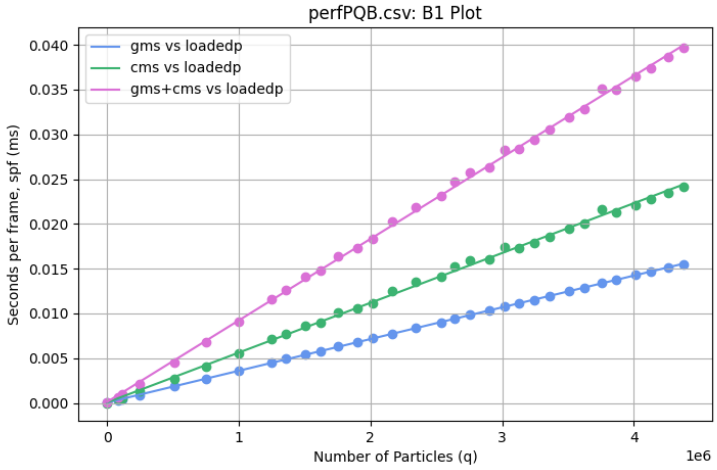

Figure 2: *spf*

Table 1: *Compute, graphics, GPU spf in milliseconds with GPU and CPU fps performance by number of particles where particle-cell density,* $\boldsymbol{max_p}$ *is 8, collision fraction,* $\boldsymbol{F}$*, is 0.5, and* ***mmrr*** *is* $4.35\ x\ 10^{-3}$ *ms.*

Particles in Dataset	Compute (Narrow) ***mcpt***	Graphics (Broad) ***mgpt***	GPU ***mcput***	Total ***maxfps***
32	6.14e-06	1.02e-05	1.63e-05	6512
82944	3.70e-04	3.02e-04	6.72e-04	1179
115712	5.15e-04	4.15e-04	9.30e-04	891
246784	1.26e-03	8.81e-04	2.14e-03	420
508928	2.71e-03	1.80e-03	4.52e-03	206
754688	4.06e-03	2.68e-03	6.74e-03	140
1000448	5.41e-03	3.54e-03	8.95e-03	106
1246208	7.06e-03	4.44e-03	1.15e-02	83
1360896	7.71e-03	4.85e-03	1.26e-02	77
1508352	8.56e-03	5.36e-03	1.39e-02	69
1623040	8.81e-03	5.72e-03	1.45e-02	66
1754112	9.98e-03	6.25e-03	1.62e-02	60
1901568	1.03e-02	6.70e-03	1.70e-02	57
2016256	1.10e-02	7.10e-03	1.81e-02	54
2163712	1.23e-02	7.65e-03	2.00e-02	49
2343936	1.30e-02	8.26e-03	2.12e-02	46
2540544	1.40e-02	8.91e-03	2.29e-02	43
2638848	1.51e-02	9.29e-03	2.43e-02	40
2753536	1.57e-02	9.74e-03	2.54e-02	39
2900992	1.58e-02	1.02e-02	2.60e-02	38
3015680	1.74e-02	1.07e-02	2.81e-02	35
3130368	1.73e-02	1.10e-02	2.83e-02	35
3245056	1.79e-02	1.14e-02	2.93e-02	34
3359744	1.85e-02	1.18e-02	3.03e-02	33
3507200	1.93e-02	1.24e-02	3.17e-02	31
3621888	1.99e-02	1.27e-02	3.27e-02	30
3752960	2.16e-02	1.33e-02	3.49e-02	29
3867648	2.11e-02	1.36e-02	3.47e-02	29
4015104	2.19e-02	1.42e-02	3.61e-02	27
4129792	2.27e-02	1.45e-02	3.73e-02	27
4260864	2.35e-02	1.50e-02	3.85e-02	26
4375552	2.41e-02	1.54e-02	3.94e-02	25

Table 2: *Compute, graphics, GPU spf in milliseconds with GPU and CPU fps performance by number of particles where particle-cell density,* $\boldsymbol{max_p}$ *is 8, collision fraction,* $\boldsymbol{F}$*, is 0.5, and* ***mmrr*** *is* $4.35x10^{-3}$ *ms.*

Total ***maxfps***	CPU Time	Compute (Narrow) ***mcpt***	Graphics (Broad) ***mgpt***	Particles in Dataset
6153	0.16	0.01	0.01	32
1161	0.86	0.37	0.31	82944
874	1.14	0.52	0.43	115712
414	2.42	1.27	0.90	246784
204	4.89	2.72	1.84	508928
139	7.22	4.06	2.73	754688
106	9.48	5.52	3.60	1000448
82	12.14	7.14	4.51	1246208
76	13.23	7.75	4.92	1360896
68	14.79	8.66	5.44	1508352
65	15.37	8.92	5.82	1623040
59	17.10	10.09	6.32	1754112
56	18.00	10.53	6.80	1901568
53	19.01	11.13	7.20	2016256
48	20.99	12.54	7.75	2163712
44	22.87	13.53	8.38	2343936
42	23.87	14.05	9.02	2540544
39	25.56	15.25	9.44	2638848
38	26.65	15.90	9.85	2753536
37	27.11	16.01	10.29	2900992
35	28.98	17.44	10.79	3015680
34	29.28	17.30	11.12	3130368
33	30.11	17.92	11.52	3245056
32	31.27	18.55	11.94	3359744
31	32.66	19.48	12.48	3507200
30	33.64	19.99	12.88	3621888
28	36.02	21.69	13.42	3752960
28	35.80	21.33	13.72	3867648
27	37.16	22.13	14.29	4015104
26	38.17	22.74	14.67	4129792
25	39.37	23.48	15.13	4260864
25	40.51	24.17	15.51	4375552