

Blender conf

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1 Comparison of different algorithms

We have 5 algorithms which are *recursive bisection 1D*, *recursive bisection 2D*, $P \times Q$ jagged split, *m-way jagged split* and *tetris*. We compare the maximum time of split for different number of available processors. Here the maximum time is measured by the time obtained in the estimation. If the code is correct, in theory: in case of split in 2, all these algorithms can give us the optimal result; in case of split in 3, the algorithms *m-way jagged split* and *tetris* can give us the optimal result; in case of split in 4, only the algorithm *m-way jagged split* can surely give us the optimal result. In case of split in 5, there are possible splits which can not be obtained by the first 4 algorithms but can be obtained by the last algorithm. The last algorithm has the possibility to "reach" all possible split but the final result it gives is not necessarily the optimal split as this algorithm is heuristic. The *recursive bisection 1D* and *recursive bisection 2D* are only available for the split in power of 2. The result of comparison is given below. We use the 5-sample estimation of the file fishy_cat.blend.

	5	6	7	8	9	10	11	12	13	14	15
recursive bisection 1D	-	-	-	13.99	-	-	-	-	-	-	-
recursive bisection 2D	-	-	-	11.75	-	-	-	-	-	-	-
$P \times Q$ jagged split	19.63	16.45	13.99	12.5	12.01	10.74	10.97	8.73	10.09	7.84	7.12
<i>m-way jagged split</i>	19.63	15.42	12.5	11.77	9.69	9.35	8.35	7.53	7.53	6.84	5.83
<i>tetris</i>	18.63	16.28	13.7	12.09	11.41	10.9	8.64	8.2	8.11	7.28	7.15
	16	17	18	19	20	21	22	23	24	25	26
recursive bisection 1D	7.8	-	-	-	-	-	-	-	-	-	-
recursive bisection 2D	6.58	-	-	-	-	-	-	-	-	-	-
$P \times Q$ jagged split	6.69	7.8	6.26	7.8	5.58	5.4	5.58	7.8	4.86	4.8	5.15
<i>m-way jagged split</i>	5.83	5.59	5.15	5.08	4.81	4.17	4.15	4.15	4.15	3.97	3.78
<i>tetris</i>	6.59	6.07	5.85	5.94	5.25	5.06	4.75	4.49	4.92	4.06	4.27
	27	28	29	30	31	32	33	34	35	36	37
recursive bisection 1D	-	-	-	-	-	7.8	-	-	-	-	-
recursive bisection 2D	-	-	-	-	-	3.82	-	-	-	-	-
$P \times Q$ jagged split	4.63	4.01	7.8	3.76	7.8	3.99	3.95	4.17	3.5	3.41	7.8
<i>m-way jagged split</i>	3.78	3.68	3.42	3.17	3.16	3.08	3.04	3.04	2.8	2.71	2.71
<i>tetris</i>	4.17	4.2	3.79	3.68	3.61	3.42	3.45	3.18	3.44	3.31	2.89
	38	39	40	41	60	62	63	64	65	70	75
recursive bisection 1D	-	-	-	-	-	-	-	7.8	-	-	-
recursive bisection 2D	-	-	-	-	-	-	-	2.46	-	-	-
$P \times Q$ jagged split	4.17	3.58	2.95	7.8	2.06	7.8	2.15	2.06	2.06	1.91	1.91
<i>m-way jagged split</i>	2.71	2.71	2.66	2.44	1.93	1.88	1.88	1.8	1.8	1.71	1.59
<i>tetris</i>	2.89	2.83	2.95	2.91	1.95	1.91	1.88	1.9	1.71	1.63	1.71

Then we do the same tests with 2000-sample estimation of the same blend file.

	5	10	63	65	70	75	80	85	90
$P \times Q$ jagged split	7795.65	4278.48	1011.71	828.84	761.3	767.84	674.97	747.91	632.14
<i>m-way jagged split</i>	7795.65	3686.29	747.91	715.51	680.03	634.47	595.1	595.1	523.88
<i>tetris</i>	7390.8	4337.98	743.79	720.04	682.08	645.29	632.14	578.55	554.3

We compare the 5 algorithms.

	8	16	32	64
recursive bisection 1D	5541.1	3084.74	3084.74	3084.74
recursive bisection 2D	4657.88	2614.01	1529.97	987.78
P × Q jagged split	4973.8	2668.86	1580.5	814.25
m-way jagged split	4657.88	2329.9	1239.43	720.04
tetris	4823.23	2833.83	1371.85	676.46

We present the results of split of the 5 algorithms below.

First are the results of split in 8 rectangles.

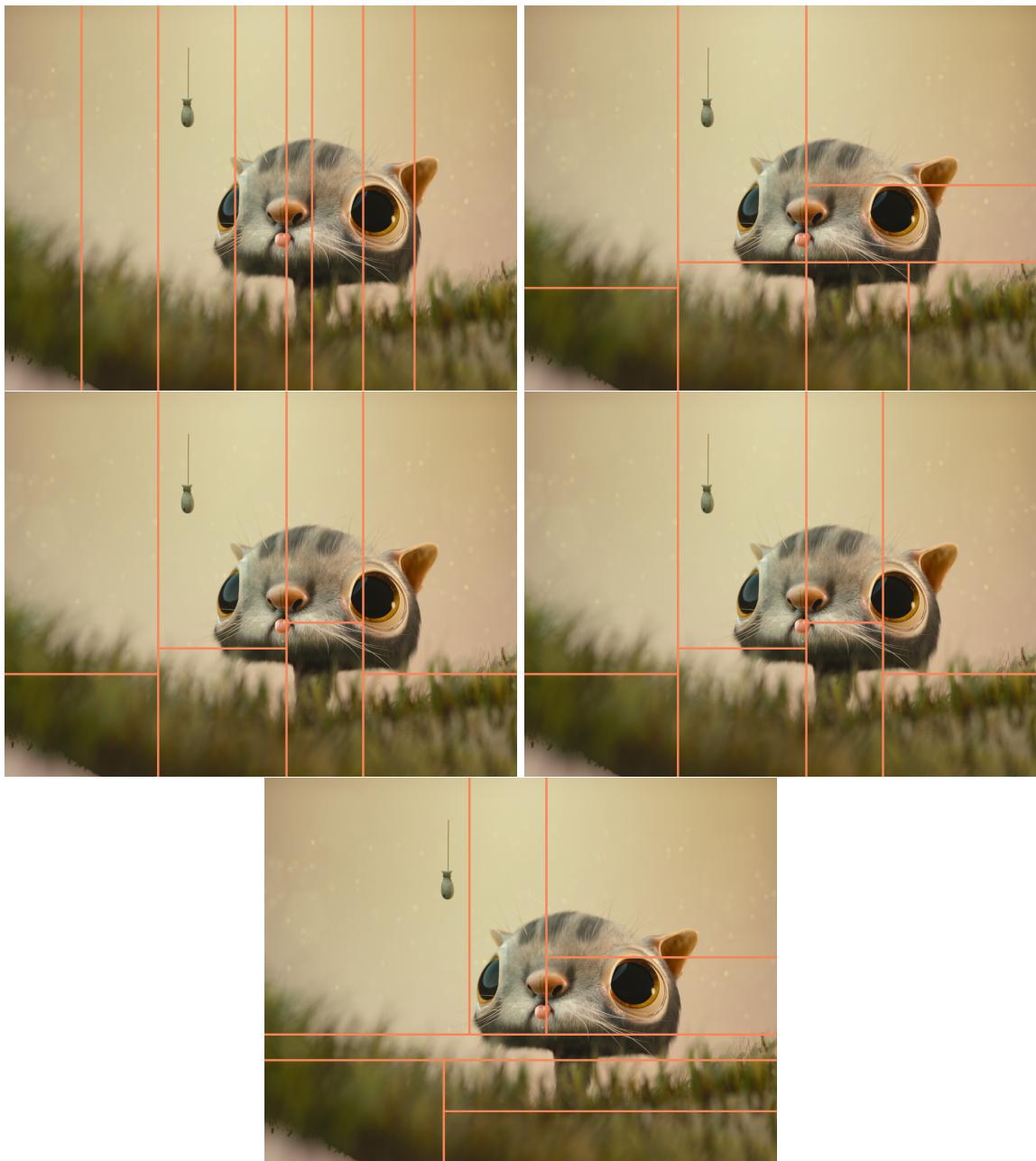


Figure 1: Split in 8 rectangles of algorithms recursive bisection 1D, recursive bisection 2D, P × Q jagged split, m-way jagged split and tetris

Secondly we present the results of split in 16 rectangles. For the split in 16 rectangles, the result of the algorithm recursive bisection 1D is trivial, so we just present the results of the four other algorithms.

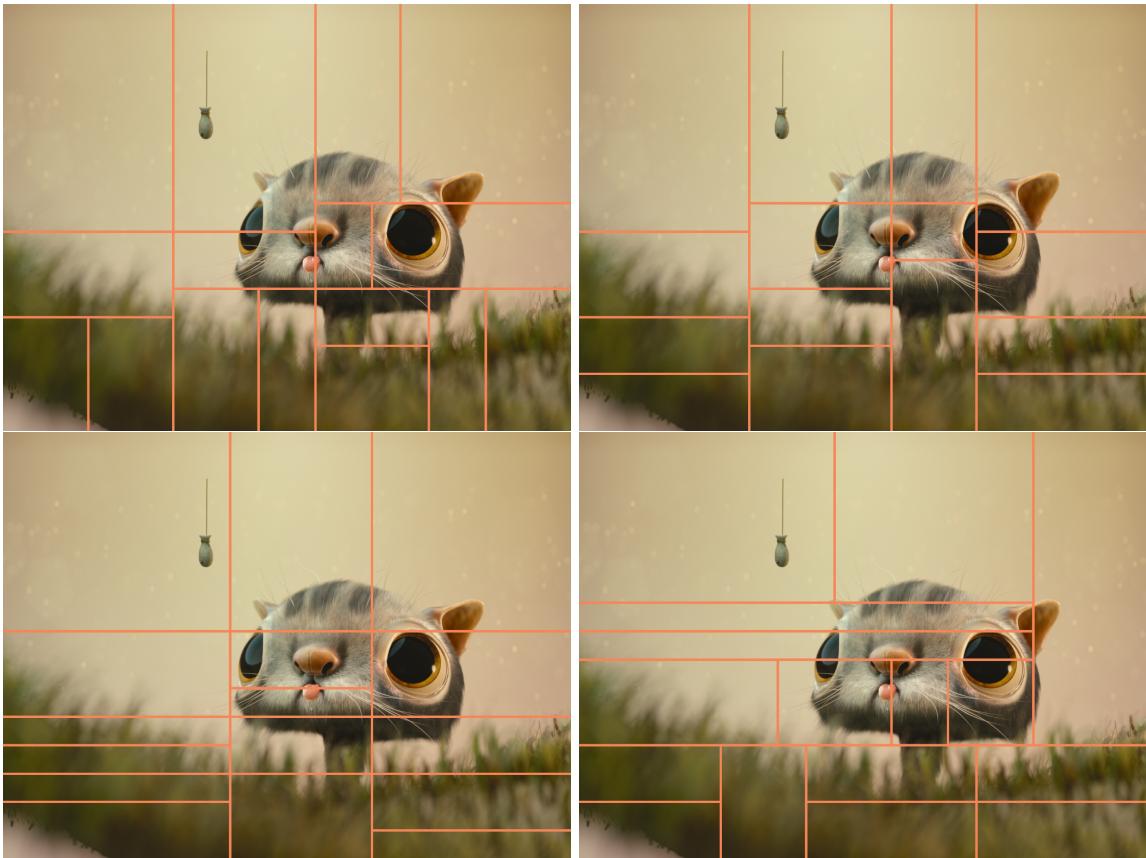


Figure 2: Split in 16 rectangles of algorithms recursive bisection 2D, $P \times Q$ jagged split, m-way jagged split and tetris

Thirdly, we present the results of split in 32 rectangles.

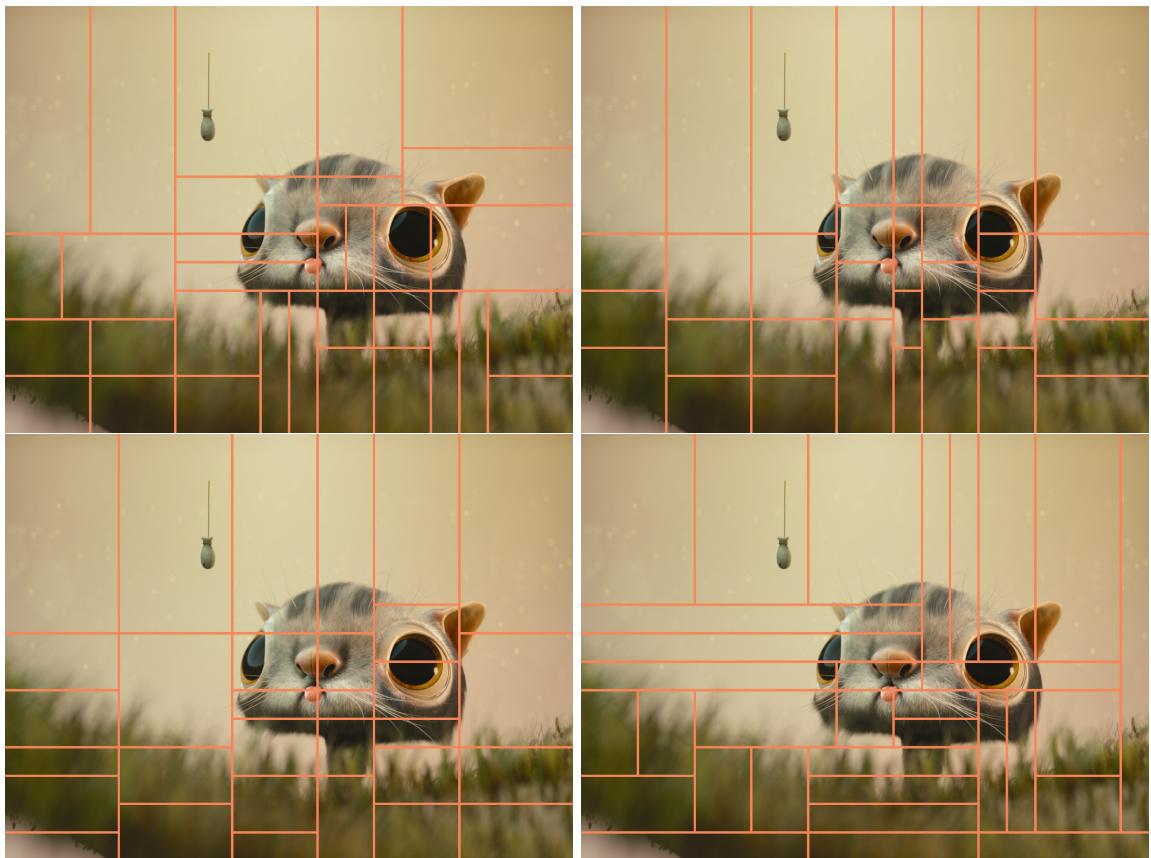


Figure 3: Split in 32 rectangles of algorithms recursive bisection 2D, $P \times Q$ jagged split, m-way jagged split and tetris