Table 1: Comparing with state-of-the-art tuners on 300 budget/30 runs. $\texttt{X}_p$ and $\texttt{X}_r$ denotes tuning with and without target performance requirement, respectively. ✗ denotes failed to complete in a reasonable time. The format follows Table **??**.

d%	System	$p_{t,1}$										
		CoTune	HEBO$_p$	HEBO$_r$	Flash$_p$	Flash$_r$	SMAC$_p$	SMAC$_r$	TurBO$_p$	TurBO$_r$	Bounce$_p$	Bounce$_r$
0.10%	7z	.28±.34 (1)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.02 (1)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)
	Kanzi	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	✗	✗	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)
	ExaStencils	.69±.46 (1)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)
	Apache	.00±.01 (1)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)
	SQLite	.00±.01 (1)	.00±.00 (2)	.00±.00 (2)	✗	✗	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)
	DConvert	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)
	DeepArch	.66±.44 (1)	.11±.21 (2)	.00±.00 (4)	.00±.00 (4)	.00±.00 (4)	.13±.24 (2)	.00±.00 (4)	.00±.00 (4)	.00±.00 (4)	.02±.07 (3)	.00±.00 (4)
	Jump3r	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	✗	✗	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)	.00±.00 (1)
	HSMGP	.92±.23 (1)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)
1%	7z	.54±.39 (1)	.02±.07 (3)	.02±.07 (3)	.02±.07 (3)	.02±.07 (3)	.02±.07 (3)	.02±.07 (3)	.09±.20 (2)	.02±.07 (3)	.02±.13 (3)	.02±.08 (3)
	Kanzi	.10±.28 (1)	.03±.13 (2)	.03±.13 (2)	✗	✗	.03±.13 (2)	.03±.13 (2)	.03±.13 (2)	.03±.13 (2)	.03±.13 (2)	.00±.00 (3)
	ExaStencils	1.00±.00 (1)	.11±.18 (3)	.30±.34 (2)	.03±.12 (4)	.03±.12 (4)	.11±.19 (3)	.03±.12 (4)	.00±.02 (5)	.04±.13 (4)	.01±.04 (5)	.00±.00 (6)
	Apache	.03±.12 (3)	.26±.27 (1)	.15±.30 (2)	.02±.08 (3)	.02±.08 (3)	.17±.26 (2)	.04±.14 (3)	.23±.26 (1)	.02±.08 (3)	.23±.26 (1)	.21±.26 (1)
	SQLite	.20±.28 (1)	.05±.15 (2)	.05±.15 (2)	✗	✗	.05±.15 (2)	.05±.15 (2)	.05±.15 (2)	.05±.15 (2)	.00±.00 (3)	.00±.00 (3)
	DConvert	.41±.14 (1)	.03±.09 (2)	.03±.09 (2)	.03±.09 (2)	.03±.09 (2)	.03±.09 (2)	.03±.09 (2)	.03±.09 (2)	.03±.09 (2)	.02±.07 (2)	.02±.07 (2)
	DeepArch	.91±.21 (1)	.67±.35 (2)	.28±.16 (4)	.00±.00 (7)	.00±.00 (7)	.40±.28 (3)	.00±.00 (7)	.00±.00 (7)	.00±.00 (7)	.08±.22 (5)	.00±.01 (6)
	Jump3r	.08±.20 (1)	.02±.11 (2)	.02±.11 (2)	✗	✗	.02±.11 (2)	.02±.11 (2)	.02±.11 (2)	.02±.11 (2)	.00±.00 (3)	.00±.00 (3)
	HSMGP	.96±.18 (1)	.08±.21 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.03±.15 (3)	.00±.00 (4)
5%	7z	.72±.20 (1)	.21±.25 (3)	.21±.25 (3)	.21±.25 (3)	.20±.25 (3)	.34±.26 (2)	.20±.25 (3)	.24±.30 (3)	.21±.25 (3)	.02±.13 (5)	.05±.11 (4)
	Kanzi	.24±.32 (1)	.20±.27 (1)	.20±.27 (1)	✗	✗	.19±.28 (1)	.20±.27 (1)	.20±.27 (1)	.20±.27 (1)	.06±.12 (2)	.06±.12 (2)
	ExaStencils	.95±.14 (1)	.22±.20 (2)	.21±.25 (2)	.06±.15 (4)	.06±.15 (4)	.20±.21 (2)	.06±.15 (4)	.11±.14 (3)	.12±.19 (3)	.01±.07 (5)	.00±.01 (6)
	Apache	.13±.06 (5)	.37±.26 (1)	.22±.27 (3)	.04±.10 (6)	.04±.10 (6)	.16±.17 (4)	.06±.14 (6)	.32±.20 (2)	.05±.10 (6)	.34±.21 (1)	.29±.19 (2)
	SQLite	.21±.22 (1)	.08±.11 (2)	.07±.11 (2)	✗	✗	.08±.11 (2)	.08±.11 (2)	.08±.11 (2)	.08±.11 (2)	.00±.00 (3)	.00±.00 (3)
	DConvert	.75±.21 (1)	.22±.29 (2)	.21±.30 (2)	.21±.30 (2)	.21±.30 (2)	.21±.30 (2)	.21±.30 (2)	.22±.29 (2)	.21±.30 (2)	.08±.20 (3)	.08±.20 (3)
	DeepArch	.99±.01 (1)	.99±.01 (2)	.97±.01 (3)	.16±.36 (6)	.16±.36 (6)	.80±.35 (4)	.16±.36 (6)	.17±.36 (6)	.16±.36 (6)	.33±.45 (5)	.05±.20 (7)
	Jump3r	.15±.31 (1)	.06±.21 (2)	.06±.21 (2)	✗	✗	.06±.21 (2)	.06±.21 (2)	.06±.21 (2)	.06±.21 (2)	.03±.13 (2)	.03±.13 (2)
	HSMGP	1.00±.00 (1)	.28±.35 (2)	.23±.32 (3)	.21±.32 (3)	.21±.32 (3)	.29±.34 (2)	.21±.32 (3)	.21±.32 (3)	.21±.32 (3)	.17±.30 (4)	.13±.26 (4)
20%	7z	.91±.16 (1)	.28±.34 (4)	.35±.34 (3)	.35±.34 (3)	.33±.35 (3)	.39±.34 (2)	.33±.35 (3)	.39±.41 (2)	.34±.35 (3)	.25±.38 (5)	.12±.19 (6)
	Kanzi	.72±.29 (1)	.67±.33 (1)	.68±.33 (1)	✗	✗	.68±.33 (1)	.68±.33 (1)	.69±.33 (1)	.68±.33 (1)	.38±.39 (2)	.37±.39 (2)
	ExaStencils	.98±.05 (1)	.68±.17 (3)	.81±.17 (2)	.25±.24 (6)	.23±.24 (6)	.29±.24 (5)	.23±.24 (6)	.35±.25 (4)	.28±.27 (5)	.07±.15 (7)	.03±.08 (8)
	Apache	.67±.08 (3)	.71±.15 (2)	.59±.13 (4)	.34±.26 (6)	.32±.25 (6)	.45±.25 (5)	.34±.26 (6)	.75±.09 (1)	.34±.25 (6)	.75±.09 (1)	.75±.08 (1)
	SQLite	.74±.26 (1)	.45±.27 (2)	.45±.27 (2)	✗	✗	.44±.28 (2)	.45±.27 (2)	.46±.26 (2)	.45±.27 (2)	.08±.14 (3)	.08±.14 (3)
	DConvert	.91±.03 (1)	.35±.24 (2)	.31±.19 (3)	.32±.20 (3)	.29±.20 (3)	.31±.21 (3)	.29±.20 (3)	.31±.21 (3)	.30±.20 (3)	.22±.23 (4)	.22±.23 (4)
	DeepArch	1.00±.00 (1)	1.00±.00 (2)	1.00±.00 (2)	.56±.30 (4)	.57±.29 (4)	.73±.16 (3)	.55±.30 (4)	.58±.29 (4)	.56±.30 (4)	.54±.22 (4)	.35±.31 (5)
	Jump3r	.27±.40 (1)	.08±.22 (2)	.08±.22 (2)	✗	✗	.08±.22 (2)	.08±.23 (2)	.08±.22 (2)	.08±.23 (2)	.03±.16 (3)	.03±.16 (3)
	HSMGP	1.00±.00 (1)	.81±.25 (2)	.73±.35 (3)	.62±.40 (4)	.61±.41 (4)	.70±.34 (3)	.62±.40 (4)	.59±.41 (4)	.67±.37 (3)	.58±.39 (4)	.54±.39 (4)
50%	7z	1.00±.00 (1)	.93±.11 (2)	.92±.12 (2)	.93±.12 (2)	.92±.12 (2)	.92±.12 (2)	.92±.12 (2)	.84±.23 (4)	.93±.12 (2)	.83±.11 (4)	.87±.12 (3)
	Kanzi	.64±.14 (1)	.57±.17 (2)	.56±.17 (2)	✗	✗	.56±.17 (2)	.53±.18 (3)	.56±.17 (2)	.56±.17 (2)	.41±.21 (4)	.41±.21 (4)
	ExaStencils	.99±.04 (1)	.70±.25 (3)	.82±.13 (2)	.29±.26 (5)	.29±.26 (5)	.29±.26 (5)	.28±.26 (5)	.43±.29 (4)	.38±.29 (4)	.08±.05 (6)	.08±.09 (6)
	Apache	.70±.03 (3)	.72±.13 (2)	.66±.07 (4)	.56±.12 (6)	.54±.14 (6)	.60±.14 (5)	.56±.16 (6)	.78±.12 (1)	.55±.14 (6)	.80±.13 (1)	.78±.12 (1)
	SQLite	.74±.16 (1)	.51±.17 (2)	.50±.17 (2)	✗	✗	.51±.17 (2)	.51±.17 (2)	.50±.17 (2)	.51±.17 (2)	.24±.13 (3)	.25±.13 (3)
	DConvert	.89±.04 (1)	.66±.23 (2)	.57±.21 (3)	.56±.21 (3)	.56±.22 (3)	.56±.21 (3)	.56±.22 (3)	.57±.20 (3)	.56±.22 (3)	.42±.21 (4)	.43±.22 (4)
	DeepArch	1.00±.00 (1)	1.00±.00 (2)	1.00±.00 (3)	.86±.09 (4)	.85±.11 (4)	.86±.09 (4)	.85±.11 (4)	.86±.11 (4)	.85±.11 (4)	.85±.06 (4)	.79±.16 (5)
	Jump3r	.45±.33 (1)	.23±.20 (2)	.23±.20 (2)	✗	✗	.23±.20 (2)	.23±.20 (2)	.23±.20 (2)	.23±.20 (2)	.12±.15 (3)	.12±.15 (3)
	HSMGP	1.00±.00 (1)	.86±.16 (2)	.84±.16 (2)	.77±.21 (3)	.75±.22 (4)	.84±.15 (2)	.76±.22 (4)	.79±.20 (3)	.78±.21 (3)	.74±.20 (4)	.73±.20 (4)
90%	7z	.77±.31 (1)	.36±.26 (2)	.35±.26 (2)	.36±.26 (2)	.35±.26 (2)	.36±.26 (2)	.35±.26 (2)	.33±.30 (2)	.36±.26 (2)	.15±.07 (4)	.20±.12 (3)
	Kanzi	.46±.19 (1)	.41±.22 (2)	.41±.23 (2)	✗	✗	.40±.22 (2)	.40±.23 (2)	.41±.22 (2)	.40±.23 (2)	.23±.21 (3)	.23±.21 (3)
	ExaStencils	1.00±.02 (1)	.86±.08 (2)	.86±.08 (2)	.63±.17 (5)	.62±.16 (5)	.60±.20 (5)	.61±.19 (5)	.69±.18 (3)	.65±.21 (4)	.35±.18 (6)	.32±.14 (6)
	Apache	.99±.00 (3)	.99±.00 (4)	1.00±.01 (1)	.98±.01 (5)	.98±.01 (5)	.98±.01 (5)	.98±.01 (5)	.98±.01 (5)	.98±.01 (5)	.99±.00 (2)	.99±.00 (2)
	SQLite	.63±.18 (1)	.50±.17 (2)	.51±.17 (2)	✗	✗	.51±.17 (2)	.51±.17 (2)	.52±.17 (2)	.52±.17 (2)	.30±.08 (3)	.30±.08 (3)
	DConvert	.88±.04 (1)	.58±.27 (2)	.52±.22 (3)	.52±.22 (3)	.52±.22 (3)	.52±.22 (3)	.52±.22 (3)	.52±.22 (3)	.52±.22 (3)	.38±.20 (4)	.38±.20 (4)
	DeepArch	1.00±.00 (1)	1.00±.00 (2)	1.00±.00 (2)	.85±.11 (3)	.85±.11 (3)	.85±.11 (3)	.85±.11 (3)	.86±.11 (3)	.85±.11 (3)	.83±.07 (4)	.79±.15 (5)
	Jump3r	.32±.17 (1)	.24±.15 (2)	.26±.19 (2)	✗	✗	.27±.19 (2)	.27±.19 (2)	.26±.19 (2)	.26±.19 (2)	.17±.14 (3)	.17±.14 (3)
	HSMGP	1.00±.00 (1)	.84±.23 (2)	.81±.24 (2)	.68±.34 (4)	.68±.35 (4)	.68±.34 (4)	.68±.34 (4)	.66±.34 (4)	.77±.26 (3)	.62±.33 (5)	.60±.34 (5)
Average p_t score/rank		.62/1.15	.39/1.96	.38/2.11	.32/3.17	.31/3.17	.33/2.39	.29/2.72	.32/2.57	.29/2.87	.24/3.22	.22/3.41