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	$p_{t,3}$									
		CoTune	HEBO$_p$	HEBO$_r$	Flash$_p$	Flash$_r$	SMAC$_p$	SMAC$_r$	TurBO$_p$	TurBO$_r$	Bounce$_p$	Bounce$_r$
0.10%	7z	.21±.33 (1)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.00 (2)	.00±.01 (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	.62±.49 (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±.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)
	SQLite	.01±.03 (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	.03±.18 (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)
	DeepArch	.72±.42 (1)	.09±.26 (2)	.00±.00 (4)	.00±.00 (4)	.00±.00 (4)	.06±.15 (2)	.00±.00 (4)	.00±.00 (4)	.00±.00 (4)	.00±.02 (3)	.00±.00 (4)
	Jump3r	.00±.00 (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)
	HSMGP	.76±.42 (1)	.00±.00 (2)	.00±.00 (3)	.00±.00 (3)	.00±.00 (3)	.00±.00 (2)	.00±.00 (3)	.00±.00 (3)	.00±.00 (3)	.00±.00 (3)	.00±.00 (3)
1%	7z	.34±.31 (1)	.00±.02 (4)	.00±.02 (4)	.00±.02 (4)	.00±.02 (4)	.00±.02 (4)	.00±.02 (4)	.05±.12 (2)	.00±.01 (4)	.01±.07 (3)	.01±.04 (4)
	Kanzi	.06±.21 (1)	.03±.12 (2)	.03±.12 (2)	✗	✗	.03±.12 (2)	.03±.12 (2)	.03±.12 (2)	.03±.12 (2)	.00±.00 (3)	.00±.00 (3)
	ExaStencils	.92±.07 (1)	.06±.19 (4)	.21±.33 (2)	.03±.14 (4)	.03±.14 (4)	.14±.27 (3)	.03±.14 (4)	.01±.03 (5)	.05±.15 (4)	.00±.03 (6)	.00±.00 (7)
	Apache	.01±.07 (5)	.45±.44 (1)	.53±.46 (1)	.05±.13 (4)	.03±.11 (5)	.13±.28 (3)	.06±.21 (4)	.33±.39 (2)	.03±.11 (5)	.35±.39 (2)	.29±.38 (2)
	SQLite	.11±.23 (1)	.04±.14 (2)	.04±.14 (2)	✗	✗	.04±.14 (2)	.04±.14 (2)	.04±.14 (2)	.04±.14 (2)	.00±.00 (3)	.00±.00 (3)
	DConvert	.24±.12 (1)	.03±.07 (2)	.03±.07 (2)	.03±.07 (2)	.03±.07 (2)	.03±.07 (2)	.03±.07 (2)	.03±.07 (2)	.03±.07 (2)	.02±.06 (2)	.02±.06 (2)
	DeepArch	.84±.26 (1)	.53±.37 (2)	.08±.01 (4)	.00±.00 (6)	.00±.00 (6)	.44±.42 (3)	.00±.00 (6)	.00±.00 (6)	.00±.00 (6)	.06±.20 (4)	.00±.01 (5)
	Jump3r	.04±.13 (1)	.02±.11 (1)	.02±.11 (1)	✗	✗	.02±.11 (1)	.02±.11 (1)	.02±.11 (1)	.02±.11 (1)	.00±.00 (2)	.00±.00 (2)
	HSMGP	.93±.25 (1)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.06±.19 (2)	.03±.14 (2)	.00±.00 (3)
5%	7z	.59±.36 (1)	.15±.27 (3)	.17±.30 (3)	.18±.29 (3)	.17±.30 (3)	.31±.34 (2)	.17±.30 (3)	.25±.36 (2)	.18±.29 (3)	.03±.15 (4)	.02±.05 (4)
	Kanzi	.29±.32 (1)	.19±.27 (2)	.19±.27 (2)	✗	✗	.20±.28 (2)	.19±.28 (2)	.20±.28 (2)	.20±.28 (2)	.10±.18 (3)	.10±.18 (3)
	ExaStencils	.91±.12 (1)	.27±.25 (3)	.39±.43 (2)	.06±.17 (6)	.06±.17 (6)	.18±.27 (4)	.06±.17 (6)	.10±.13 (5)	.08±.18 (5)	.02±.07 (7)	.00±.01 (8)
	Apache	.22±.13 (3)	.53±.31 (1)	.25±.22 (3)	.06±.14 (5)	.06±.14 (5)	.19±.20 (4)	.08±.20 (5)	.44±.26 (2)	.06±.14 (5)	.41±.25 (2)	.41±.25 (2)
	SQLite	.23±.27 (1)	.13±.19 (2)	.11±.18 (2)	✗	✗	.13±.19 (2)	.13±.19 (2)	.13±.19 (2)	.13±.18 (2)	.00±.00 (3)	.00±.00 (3)
	DConvert	.48±.08 (1)	.12±.19 (2)	.10±.15 (2)	.10±.15 (2)	.10±.15 (2)	.10±.15 (2)	.10±.15 (2)	.10±.15 (2)	.09±.15 (2)	.04±.11 (3)	.04±.11 (3)
	DeepArch	.99±.01 (1)	.98±.01 (2)	.98±.01 (3)	.17±.36 (6)	.17±.36 (6)	.81±.36 (4)	.17±.36 (6)	.17±.36 (6)	.17±.37 (6)	.35±.45 (5)	.05±.19 (7)
	Jump3r	.08±.20 (1)	.06±.19 (1)	.06±.19 (1)	✗	✗	.06±.19 (1)	.05±.19 (1)	.06±.19 (1)	.06±.19 (1)	.02±.12 (2)	.02±.12 (2)
	HSMGP	.96±.18 (1)	.28±.33 (2)	.22±.30 (2)	.19±.30 (3)	.19±.30 (3)	.26±.30 (2)	.19±.30 (3)	.18±.30 (3)	.19±.30 (3)	.15±.27 (3)	.10±.21 (4)
20%	7z	.82±.21 (1)	.46±.35 (3)	.49±.34 (3)	.50±.33 (3)	.47±.34 (3)	.60±.27 (2)	.47±.34 (3)	.48±.37 (3)	.49±.34 (3)	.26±.32 (4)	.26±.27 (4)
	Kanzi	.37±.19 (1)	.37±.16 (1)	.36±.17 (1)	✗	✗	.35±.17 (1)	.36±.17 (1)	.36±.17 (1)	.36±.17 (1)	.20±.19 (2)	.20±.19 (2)
	ExaStencils	.96±.07 (1)	.58±.16 (3)	.63±.17 (2)	.27±.20 (6)	.26±.20 (6)	.34±.19 (5)	.23±.19 (6)	.39±.19 (4)	.31±.22 (5)	.09±.14 (7)	.03±.08 (8)
	Apache	.14±.07 (3)	.22±.19 (2)	.11±.08 (4)	.07±.09 (5)	.07±.09 (5)	.09±.10 (5)	.09±.14 (5)	.32±.20 (1)	.08±.09 (5)	.30±.19 (1)	.30±.18 (1)
	SQLite	.24±.16 (1)	.15±.08 (2)	.15±.08 (2)	✗	✗	.15±.08 (2)	.15±.08 (2)	.15±.08 (2)	.15±.08 (2)	.03±.06 (3)	.03±.06 (3)
	DConvert	.89±.05 (1)	.51±.38 (2)	.26±.27 (3)	.29±.25 (3)	.25±.26 (3)	.29±.25 (3)	.25±.26 (3)	.27±.26 (3)	.26±.27 (3)	.13±.18 (4)	.11±.19 (4)
	DeepArch	1.00±.00 (1)	.99±.01 (2)	.99±.00 (3)	.48±.27 (6)	.48±.27 (6)	.60±.23 (4)	.48±.27 (6)	.54±.29 (5)	.47±.28 (6)	.52±.27 (5)	.29±.25 (7)
	Jump3r	.10±.23 (1)	.07±.20 (1)	.07±.20 (1)	✗	✗	.08±.20 (1)	.08±.20 (1)	.08±.20 (1)	.05±.13 (2)	.03±.13 (2)	.03±.13 (2)
	HSMGP	.97±.14 (1)	.75±.25 (2)	.69±.25 (3)	.54±.36 (5)	.53±.37 (5)	.61±.32 (4)	.54±.36 (5)	.52±.37 (5)	.60±.32 (4)	.51±.32 (5)	.48±.33 (5)
50%	7z	.93±.18 (1)	.40±.37 (2)	.41±.38 (2)	.43±.37 (2)	.41±.38 (2)	.41±.38 (2)	.41±.38 (2)	.32±.39 (3)	.41±.38 (2)	.10±.19 (5)	.18±.25 (4)
	Kanzi	.50±.15 (1)	.41±.12 (2)	.40±.12 (2)	✗	✗	.40±.12 (2)	.40±.12 (2)	.40±.12 (2)	.41±.12 (2)	.29±.12 (3)	.30±.12 (3)
	ExaStencils	.99±.02 (1)	.79±.11 (3)	.82±.11 (2)	.52±.19 (5)	.53±.17 (5)	.52±.19 (5)	.51±.20 (5)	.60±.16 (4)	.57±.22 (4)	.27±.15 (6)	.23±.15 (7)
	Apache	.69±.07 (2)	.65±.15 (3)	.69±.17 (2)	.43±.16 (4)	.44±.16 (4)	.46±.18 (4)	.44±.17 (4)	.74±.09 (1)	.44±.16 (4)	.75±.09 (1)	.74±.09 (1)
	SQLite	.80±.21 (1)	.54±.22 (3)	.54±.22 (3)	✗	✗	.53±.22 (3)	.54±.22 (3)	.52±.21 (3)	.57±.22 (2)	.20±.15 (4)	.20±.15 (4)
	DConvert	.93±.03 (1)	.41±.32 (2)	.28±.24 (3)	.30±.24 (3)	.29±.24 (3)	.30±.24 (3)	.29±.24 (3)	.31±.23 (3)	.27±.23 (3)	.22±.17 (4)	.21±.17 (4)
	DeepArch	1.00±.00 (1)	.99±.00 (2)	.99±.00 (2)	.73±.15 (3)	.73±.15 (3)	.73±.15 (3)	.74±.13 (3)	.73±.14 (3)	.73±.15 (3)	.69±.10 (4)	.64±.14 (5)
	Jump3r	.35±.24 (1)	.27±.15 (2)	.27±.15 (2)	✗	✗	.27±.15 (2)	.27±.15 (2)	.27±.15 (2)	.27±.15 (2)	.22±.11 (3)	.22±.11 (3)
	HSMGP	.98±.11 (1)	.75±.20 (2)	.73±.21 (2)	.66±.25 (4)	.65±.26 (4)	.73±.18 (2)	.65±.25 (4)	.67±.24 (4)	.69±.22 (3)	.62±.23 (5)	.60±.23 (5)
90%	7z	.94±.15 (1)	.54±.27 (2)	.56±.26 (2)	.54±.27 (2)	.55±.27 (2)	.55±.27 (2)	.55±.27 (2)	.50±.28 (3)	.54±.27 (2)	.34±.14 (5)	.38±.16 (4)
	Kanzi	.30±.28 (1)	.15±.11 (2)	.14±.11 (2)	✗	✗	.15±.11 (2)	.14±.11 (2)	.14±.11 (2)	.14±.11 (2)	.07±.06 (3)	.07±.06 (3)
	ExaStencils	.98±.04 (1)	.61±.20 (2)	.56±.17 (3)	.30±.15 (5)	.30±.14 (5)	.30±.15 (5)	.29±.15 (5)	.35±.12 (4)	.33±.15 (4)	.18±.12 (6)	.15±.06 (7)
	Apache	.98±.00 (3)	.98±.01 (3)	.99±.01 (1)	.97±.01 (4)	.97±.01 (4)	.97±.01 (4)	.98±.01 (4)	.98±.01 (4)	.98±.01 (4)	.98±.00 (2)	.98±.00 (2)
	SQLite	.78±.22 (1)	.54±.21 (2)	.53±.21 (2)	✗	✗	.55±.21 (2)	.54±.21 (2)	.55±.21 (2)	.55±.21 (2)	.26±.11 (3)	.26±.11 (3)
	DConvert	.88±.13 (1)	.55±.28 (2)	.54±.28 (2)	.54±.28 (2)	.54±.28 (2)	.54±.28 (2)	.54±.28 (2)	.55±.28 (2)	.55±.28 (2)	.36±.26 (3)	.36±.26 (3)
	DeepArch	1.00±.00 (1)	.99±.00 (2)	.99±.00 (3)	.73±.15 (4)	.73±.15 (4)	.73±.15 (4)	.73±.15 (4)	.73±.15 (4)	.73±.15 (4)	.67±.11 (5)	.64±.14 (6)
	Jump3r	.09±.20 (1)	.08±.20 (1)	.08±.20 (1)	✗	✗	.08±.20 (1)	.08±.20 (1)	.08±.20 (1)	.08±.20 (1)	.04±.13 (2)	.04±.13 (2)
	HSMGP	.98±.13 (1)	.77±.17 (2)	.68±.29 (3)	.61±.31 (4)	.59±.32 (5)	.61±.31 (4)	.59±.31 (5)	.62±.30 (4)	.64±.29 (4)	.54±.30 (5)	.54±.30 (5)
Average p_t score/rank		.56/1.11	.34/1.94	.32/2.11	.27/3.22	.27/3.25	.28/2.39	.24/2.69	.27/2.65	.24/2.91	.29/2.72	.18/3.57