

Table 4. A comparison of the Cross Project Prediction performances. In the last row, the number in the parentheses shows the percentage improvement over Grace [29]. The best result is marked in bold.

System (# faults)	Techniques	Top-1	Top-3	Top-5	Top-10	MFR	MAR
Cli (39)	Grace	9.25	14.917	17.5	21.667	15.156	17.694
	DepGraph	9.846	17.462	21	26.846	8.13	9.511
	DepGraph + Code Change	13.083	19.583	22.417	28.417	6.702	8.011
Closure (174)	Grace	32.456	63.986	78.492	94.432	24.611	29.011
	DepGraph	38.231	70.231	92.538	115.923	17.55	22.039
	DepGraph + Code Change	41.545	73.111	97.736	116.672	14.753	21.555
Codecc (18)	Grace	5.333	10.5	12.083	14.917	4.093	6.21
	DepGraph	5.923	11.385	13	15.462	3.208	4.489
	DepGraph + Code Change	6.667	10.667	12.583	16.083	2.99	5.549
Collections (4)	Grace	1.25	1.5	1.833	1.833	2.958	2.958
	DepGraph	1.154	1.538	1.923	2	1.192	1.192
	DepGraph + Code Change	1.667	2	2	2	0.25	0.25
Compress (47)	Grace	14.833	23.833	28	33.417	11.406	13.686
	DepGraph	17.846	27.846	32.077	37.769	6.494	7.73
	DepGraph + Code Change	21.417	31.833	36.417	41.333	4.619	5.696
Csv (16)	Grace	5.583	7.75	9.167	10.75	10.578	11.083
	DepGraph	6	8.615	10.769	12.923	5.947	6.106
	DepGraph + Code Change	6.75	8.417	10.5	12.5	7.203	7.451
Gson (18)	Grace	7.417	10.167	11.75	13.167	13.784	14.23
	DepGraph	9.231	11.615	12.692	14.308	4.195	4.509
	DepGraph + Code Change	7.917	11.667	13.5	15	6.475	6.739
JacksonCore (26)	Grace	0.917	3.167	3.667	5.417	41.851	47.374
	DepGraph	7.154	12.462	13.462	15.385	4.822	6.171
	DepGraph + Code Change	8.667	12.667	13.833	14.75	8.246	9.823
JacksonXml (6)	Grace	0.75	1.667	1.917	3	25.733	25.733
	DepGraph	1.538	2.615	3.077	4.154	4.215	4.215
	DepGraph + Code Change	2	3.333	4.333	4.833	2.15	2.15
Jsoup (93)	Grace	25.667	42.833	53.417	61.667	29.87	36.572
	DepGraph	36.231	50.154	61.462	69.846	11.028	13.879
	DepGraph + Code Change	43.25	60.583	68.917	77.5	4.766	7.503
Lang (64)	Grace	34.583	48.25	52.583	57.333	3.035	3.584
	DepGraph	37.462	50.077	54.538	60	1.935	2.241
	DepGraph + Code Change	42.667	53.583	57.75	60.75	1.507	1.795
Math (106)	Grace	41	60.583	69.5	82.25	8.452	9.302
	DepGraph	46.923	71.077	82.615	94.538	2.922	3.297
	DepGraph + Code Change	55.25	82.917	91.917	99.417	1.748	2.103
Mockito (38)	Grace	10.417	18	20.167	24.083	21.514	28.657
	DepGraph	13.385	25.231	28.846	32.538	3.788	4.852
	DepGraph + Code Change	17.5	27.083	30.917	33.167	2.618	3.474
Time (26)	Grace	7.5	11.75	14.333	17	19.587	22.058
	DepGraph	10.769	14.692	16.154	18.385	10.893	11.752
	DepGraph + Code Change	11.083	15.333	17.417	20	8.948	10.034
Total (675)	Grace	196.956	318.903	374.409	440.933	16.616	19.154
	DepGraph	241.693 (23%)	375 (18%)	444.153 (19%)	520.077 (18%)	6.166 (63%)	7.285 (62%)
	DepGraph + Code Change	279.463 (42%)	412.777 (29%)	480.237 (28%)	542.422 (23%)	5.213 (68%)	6.581 (65%)