Supplementary Material for "From Individual-Level Learning to Dimensional-Level Learning: Dimension Match Learning Multitask Optimization"

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TABLE S.I THE CEC17 EXPERIMENTAL RESULTS OF DMLMTO AND FIXED dlp

Problem	DMLMTO	dlp = 0.0	dlp = 0.2	dlp = 0.3	dlp = 0.4	dlp = 0.5	dlp = 0.6	dlp = 0.7	dlp = 0.8	dlp = 0.9	dlp = 1.0
CIHS-T1	**0**	2.49E−4(+)	**0(≈)**	**0(≈)**	**0(≈)**	**0(≈)**	**0(≈)**	**0(≈)**	7.17E−4(≈)	**0(≈)**	2.95E−4(≈)
CIHS-T2	**0**	2.06E+0(+)	**0(≈)**	**0(≈)**	**0(≈)**	1.14E−14(+)	2.08E−14(+)	5.12E−14(+)	8.21E−1(+)	9.28E−14(+)	3.64E−1(+)
CIMS-T1	**2.18E−11**	2.52E−6(+)	6.76E−11(+)	7.15E−10(+)	1.62E−7(+)	4.23E−5(+)	1.10E−3(+)	1.27E−2(+)	3.67E−2(+)	8.57E−2(+)	3.36E−1(+)
CIMS-T2	**0**	8.99E−9(+)	**0(≈)**	**0(≈)**	3.43E−11(+)	1.98E−6(+)	1.52E−3(+)	1.84E−1(+)	9.34E−1(+)	4.24E+0(+)	3.14E+1(+)
CILS-T1	2.07E+1	2.06E+1(≈)	2.09E+1(≈)	**2.04E+1(≈)**	2.11E+1(+)	2.12E+1(+)	2.05E+1(+)	2.12E+1(+)	2.07E+1(+)	2.12E+1(+)	2.12E+1(+)
CILS-T2	3.00E+3	**2.88E+3(≈)**	3.05E+3(≈)	3.24E+3(+)	3.32E+3(+)	3.59E+3(+)	3.77E+3(+)	5.33E+3(+)	7.32E+3(+)	1.19E+4(+)	1.64E+4(+)
PIHS-T1	1.03E+2	9.92E+1(≈)	9.94E+1(≈)	**9.46E+1(≈)**	1.08E+2(≈)	1.08E+2(≈)	1.08E+2(≈)	1.21E+2(+)	1.93E+2(+)	4.13E+2(+)	5.06E+2(+)
PIHS-T2	1.19E−9	**3.19E−10(−)**	1.85E−8(+)	2.31E−7(+)	3.43E−6(+)	7.05E−5(+)	1.65E−3(+)	4.66E−2(+)	1.00E+0(+)	5.56E+1(+)	4.75E+3(+)
PIMS-T1	**1.11E−5**	3.74E−5(+)	1.79E−5(+)	6.82E−5(+)	1.89E−1(+)	3.81E−1(+)	2.67E−1(+)	8.67E−1(+)	1.26E+0(+)	1.75E+0(+)	3.30E+0(+)
PIMS-T2	5.60E+1	7.08E+1(+)	5.44E+1(+)	5.19E+1(+)	**4.30E+1(+)**	5.13E+1(+)	4.75E+1(≈)	4.94E+1(+)	5.87E+1(+)	9.36E+1(+)	1.67E+2(+)
PILS-T1	2.51E−4	2.64E−3(+)	2.89E−5(−)	2.19E−4(−)	**1.60E−5(−)**	4.12E−5(−)	1.03E−4(+)	9.91E−5(+)	3.56E−4(≈)	1.89E−5(−)	8.83E−2(+)
PILS-T2	2.43E−3	3.33E−1(+)	**6.81E−4(−)**	6.89E−4(−)	8.84E−4(−)	1.73E−3(≈)	2.58E−3(≈)	4.39E−3(+)	8.48E−3(+)	1.69E−3(≈)	2.98E−1(+)
NIHS-T1	4.78E+1	9.02E+1(+)	4.77E+1(+)	**4.68E+1(+)**	4.80E+1(+)	4.82E+1(+)	4.81E+1(+)	4.86E+1(+)	4.88E+1(+)	5.24E+1(+)	6.11E+1(+)
NIHS-T2	1.86E+0	4.41E+1(+)	1.03E+0(≈)	3.42E+0(+)	5.31E−1(+)	**3.10E−6(+)**	1.16E+0(+)	2.93E+0(+)	1.09E+0(+)	1.02E+1(+)	2.64E+1(+)
NIMS-T1	**3.63E−7**	4.93E−4(≈)	3.30E−4(+)	5.59E−6(+)	2.90E−4(+)	2.18E−4(+)	1.94E−3(+)	1.18E−2(+)	8.91E−2(+)	6.03E−1(+)	1.30E+0(+)
NIMS-T2	9.83E−1	2.99E+0(+)	**7.07E−1(≈)**	8.74E−1(≈)	1.06E+0(≈)	1.09E+0(≈)	1.75E+0(+)	2.57E+0(+)	4.32E+0(+)	8.21E+0(+)	1.69E+1(+)
NILS-T1	1.24E+2	1.15E+2(≈)	1.24E+2(≈)	**1.14E+2(+)**	1.19E+2(+)	1.16E+2(+)	1.21E+2(+)	2.01E+2(+)	4.05E+2(+)	5.21E+2(+)	1.30E+3(+)
NILS-T2	**2.37E+3**	2.55E+3(≈)	2.61E+3(+)	2.77E+3(+)	2.72E+3(+)	3.09E+3(+)	3.30E+3(+)	3.64E+3(+)	4.48E+3(+)	7.93E+3(+)	1.67E+4(+)
Number of +/≈/−		11 / 6 / 1	6 / 10 / 2	8 / 8 / 2	10 / 6 / 2	11 / 6 / 1	12 / 5 / 1	15 / 3 / 0	16 / 2 / 0	15 / 2 / 1	17 / 1 / 0

TABLE S.II THE CEC17 EXPERIMENTAL RESULTS OF DMLMTO AND FIXED eop

Problem	DMLMTO	eop = 0.0	eop = 0.1	eop = 0.2	eop = 0.3	eop = 0.4	eop = 0.5	eop = 0.6	eop = 0.7	eop = 0.9	eop = 1.0
CIHS-T1	**0**	1.08E−1(+)	3.67E−2(+)	8.58E−3(+)	6.76E−4(+)	1.33E−16(+)	3.36E−10(≈)	**0(≈)**	**0(≈)**	**0(≈)**	**0(≈)**
CIHS-T2	**0**	7.76E+1(+)	4.14E+1(+)	1.73E+1(+)	2.39E+0(+)	1.88E−13(+)	4.28E−7(≈)	**0(≈)**	**0(≈)**	**0(≈)**	**0(≈)**
CIMS-T1	**2.18E−11**	7.83E−1(+)	2.73E−1(+)	1.76E−1(+)	7.21E−2(+)	1.37E−8(+)	4.45E−10(+)	1.73E−10(+)	4.69E−11(+)	2.26E−11(≈)	1.20E−10(+)
CIMS-T2	**0**	4.69E+1(+)	1.70E+1(+)	8.13E+0(+)	5.67E+0(+)	3.28E−12(≈)	**0(≈)**	**0(≈)**	**0(≈)**	**0(≈)**	**0(≈)**
CILS-T1	2.07E+1	2.03E+1(≈)	2.01E+1(−)	2.01E+1(+)	2.00E+1(−)	2.01E+1(−)	**1.94E+1(−)**	2.02E+1(−)	2.02E+1(−)	2.11E+1(+)	2.12E+1(+)
CILS-T2	3.00E+3	4.50E+3(+)	3.89E+3(+)	3.81E+3(+)	3.64E+3(+)	3.39E+3(+)	3.42E+3(+)	3.24E+3(≈)	3.22E+3(≈)	**2.89E+3(≈)**	1.10E+4(+)
PIHS-T1	1.03E+2	3.20E+2(+)	2.33E+2(+)	2.11E+2(+)	1.68E+2(+)	1.52E+2(+)	1.35E+2(+)	1.32E+2(+)	1.12E+2(≈)	**9.60E+1(≈)**	2.56E+2(+)
PIHS-T2	1.19E−9	1.92E+1(+)	1.38E+0(+)	3.01E−1(+)	5.18E−2(+)	1.31E−2(+)	2.40E−4(+)	9.82E−5(+)	**4.55E−10(−)**	1.57E−8(+)	4.30E−6(+)
PIMS-T1	**1.11E−5**	2.35E+0(+)	1.95E+0(+)	1.68E+0(+)	9.74E−1(+)	5.20E−1(+)	2.17E−1(+)	2.94E−2(+)	4.96E−5(+)	1.67E−5(+)	6.74E−5(+)
PIMS-T2	5.60E+1	1.24E+2(+)	9.46E+1(+)	7.59E+1(+)	5.23E+1(≈)	5.80E+1(≈)	5.15E+1(≈)	5.19E+1(≈)	5.47E+1(≈)	4.67E+1(≈)	**4.65E+1(−)**
PILS-T1	2.51E−4	3.02E−1(+)	3.02E−1(+)	3.48E−1(+)	1.73E−1(+)	6.11E−2(+)	1.28E−1(+)	7.21E−2(+)	1.10E−2(+)	**1.14E−4(+)**	1.07E−3(+)
PILS-T2	2.43E−3	7.07E−1(+)	6.27E−1(+)	6.46E−1(+)	4.09E−1(+)	2.08E−1(+)	1.73E−1(+)	9.24E−2(+)	2.17E−2(+)	2.14E−3(−)	**1.05E−3(≈)**
NIHS-T1	4.78E+1	1.07E+2(+)	8.27E+1(+)	5.26E+1(+)	6.32E+1(+)	5.00E+1(+)	4.87E+1(+)	5.14E+1(≈)	5.03E+1(≈)	4.79E+1(≈)	**4.77E+1(−)**
NIHS-T2	1.86E+0	5.38E+1(+)	2.57E+1(+)	1.25E+1(+)	1.44E+1(+)	1.05E+1(+)	5.90E+0(+)	7.10E+0(+)	4.54E+0(+)	**5.84E−9(+)**	6.08E−7(+)
NIMS-T1	**3.63E−7**	4.83E−1(+)	2.09E−1(+)	1.25E−1(+)	5.60E−2(+)	2.75E−2(+)	7.23E−3(+)	1.55E−3(+)	5.85E−4(+)	5.99E−7(+)	1.98E−5(+)
NIMS-T2	9.83E−1	1.46E+1(+)	1.33E+1(+)	1.18E+1(+)	8.75E+0(+)	6.78E+0(+)	5.14E+0(+)	3.10E+0(+)	1.77E+0(+)	2.98E−1(+)	**2.23E−1(−)**
NILS-T1	1.24E+2	7.36E+2(+)	5.14E+2(+)	3.86E+2(+)	3.38E+2(+)	2.79E+2(+)	2.17E+2(+)	1.83E+2(+)	1.57E+2(+)	**8.92E+1(−)**	3.35E+2(+)
NILS-T2	2.37E+3	4.45E+3(+)	3.85E+3(+)	3.71E+3(+)	3.50E+3(+)	3.63E+3(+)	3.34E+3(+)	3.05E+3(+)	2.79E+3(+)	2.13E+3(+)	**2.11E+3(−)**
Number of +/≈/−		17 / 1 / 0	17 / 0 / 1	17 / 0 / 1	16 / 1 / 1	14 / 3 / 1	13 / 4 / 1	10 / 6 / 2	9 / 7 / 2	6 / 9 / 3	10 / 4 / 4