

Table 1: IGD, Mean and standard deviation

Obj.	problem	HypE	MOEAD	MOEADD	MOMBI2	NSGAII	NSGAIII	SPEA2	SPEA2SDE	ThetaDEA
5	MaF01	0.00216	0.00194	0.00234	0.00243	0.00160	0.00195	0.00134	<b>0.00116</b>	0.00238
	MaF02	0.0138	0.0110	<b>0.00732</b>	0.0106	0.00979	0.00909	<b>0.00679</b>	0.00712	0.00960
	MaF03	0.0573	0.0101	0.00160	0.00424	575	<b>0.000835</b>	3.73e+08	0.00124	0.00141
	MaF04	0.0318	0.0503	0.675	0.0327	<b>0.0212</b>	0.0362	<b>0.0188</b>	0.0381	0.0332
	MaF05	0.0862	0.0693	0.0593	<b>0.0225</b>	0.0252	0.0231	0.0243	0.0280	0.0231
	MaF06	0.00255	0.000432	0.000915	0.00371	4.03e-05	0.000594	<b>2.70e-05</b>	9.65e-05	0.00125
	MaF07	0.00573	0.00730	0.00604	0.00413	0.00333	0.00342	0.00316	<b>0.00313</b>	0.00348
	MaF08	0.00991	0.00144	2.04	0.00400	0.00171	0.00318	<b>0.00114</b>	0.00130	0.00459
	MaF09	0.00784	0.00163	0.0111	0.00458	0.00717	0.00679	0.00122	<b>0.00105</b>	0.0106
	MaF10	0.0216	0.0246	0.0138	<b>0.00785</b>	0.00840	0.0107	0.0162	0.0112	0.00917
	MaF11	0.0920	0.0177	0.0599	0.0165	0.00958	0.0110	<b>0.00750</b>	0.0216	0.0132
	MaF12	0.0486	0.0325	0.0117	0.0118	0.0125	0.0106	0.0113	0.0123	<b>0.0106</b>
	MaF13	0.00397	0.00148	0.00193	0.00666	0.00168	0.00388	1.23e+03	<b>0.00112</b>	0.00360
	MaF14	<b>0.00578</b>	0.00785	<b>0.00410</b>	0.00696	0.274	0.0147	53.0	0.00474	0.0144
	MaF15	0.00671	<b>0.00325</b>	0.00513	<b>0.00428</b>	0.295	0.0126	0.0890	0.00366	0.0114
10	MaF01	0.00425	0.00355	0.00613	0.00491	0.00352	0.00403	0.00345	<b>0.00270</b>	0.00415
	MaF02	0.00478	0.00375	0.00342	0.00623	<b>0.00204</b>	0.00266	0.00209	0.00215	0.00267
	MaF03	38.2	0.00218	0.00184	0.00617	4.23e+03	0.00569	1.70e+10	<b>0.00174</b>	0.00203
	MaF04	1.03	3.60	98.4	1.95	0.802	1.87	<b>0.772</b>	1.97	1.71
	MaF05	2.43	4.45	4.39	4.29	1.27	<b>1.18</b>	2.08	1.70	1.23
	MaF06	<b>0.00251</b>	<b>0.000284</b>	0.00211	0.00653	0.00399	0.00394	1.46	0.00563	0.00286
	MaF07	0.0565	0.00917	0.0148	0.0151	0.0119	0.0120	0.0177	<b>0.00749</b>	0.00827
	MaF08	0.00588	0.00190	0.0227	0.0146	0.00210	0.00540	<b>0.00152</b>	0.00172	0.0110
	MaF09	0.0212	0.00343	0.0687	0.0143	0.440	0.0120	0.607	<b>0.00138</b>	0.0111
	MaF10	0.0426	0.0393	0.0344	<b>0.0249</b>	0.0219	0.0241	0.0364	0.0248	<b>0.0216</b>
	MaF11	0.129	0.101	0.114	0.0704	0.0160	0.0371	<b>0.0156</b>	0.0673	0.0332
	MaF12	0.0905	0.0855	0.0815	0.0653	0.0612	0.0573	0.0585	<b>0.0546</b>	0.0568
	MaF13	0.00397	0.00317	0.00435	0.00795	0.00175	0.00491	<b>0.00116</b>	0.00120	0.00669
	MaF14	1.46	0.00945	0.00895	<b>0.00955</b>	1.18	0.0454	361	<b>0.00447</b>	0.0450
	MaF15	<b>0.0113</b>	0.0557	0.0125	0.0127	1.29	0.0105	3.45	<b>0.00922</b>	0.0154
15	MaF01	0.00732	0.00543	0.00765	0.00599	0.00489	0.00503	0.00519	<b>0.00449</b>	0.00493
	MaF02	0.00727	0.00520	0.00465	0.0107	<b>0.00251</b>	0.00392	0.00332	0.00330	0.00415
	MaF03	9.40e+05	0.00245	<b>0.00206</b>	0.00694	421	0.00741	2.28e+10	0.00212	0.00457
	MaF04	998	50.7	3.20e+03	104	33.6	69.1	<b>28.8</b>	95.8	83.4
	MaF05	98.6	125	117	125	<b>36.0</b>	55.0	76.7	50.7	55.0
	MaF06	0.242	<b>0.000335</b>	0.00198	0.00791	0.00462	0.00448	2.03	0.00440	0.00356
	MaF07	0.368	0.0152	0.0260	0.0520	0.0262	0.0684	0.0735	<b>0.0123</b>	0.0564
	MaF08	0.00825	0.00244	7.90	0.0280	<b>0.00356</b>	0.00743	<b>0.00243</b>	0.00311	0.0154
	MaF09	0.0683	0.0102	0.0801	0.0678	0.0780	0.0171	0.00662	<b>0.00225</b>	0.0404
	MaF10	0.0578	0.0534	0.0506	0.0550	<b>0.0315</b>	0.0338	0.0546	0.0473	0.0334
	MaF11	0.219	0.205	0.205	0.201	<b>0.0159</b>	0.0604	0.0374	0.155	0.138
	MaF12	0.226	0.174	0.150	0.143	0.121	0.121	0.132	<b>0.119</b>	0.121
	MaF13	0.00528	0.00563	0.00607	0.0110	0.00453	0.00659	2.63e+04	<b>0.00179</b>	0.00801
	MaF14	0.0223	0.0121	0.00754	<b>0.00934</b>	0.297	0.0190	662	<b>0.00559</b>	0.0156
	MaF15	<b>0.0140</b>	0.110	0.0153	0.0196	0.852	0.0672	4.39	<b>0.0136</b>	0.0184