

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