Supplementary Report: Information Analysis Results

Josu Ceberio, Ekhine Irurozki,
Alexander Mendiburu, and Jose A. Lozano *†

July 1, 2014

Abstract

In this report we introduce the raw results obtained in the fitness landscape analysis carried out in the paper *A Review of Distances for the Mallows and Generalized Mallows Estimation of Distribution Algorithms* submitted to the journal *Computational Optimization and Applications*. Particularly, we summarise the results obtained by applying *information analysis* techniques, $H(\epsilon)$ and $M(\epsilon)$, to the fitness landscapes generated by the *swap*, *interchange* and *insert* neighbourhoods on a benchmark of 40 instances of the Linear Ordering Problem (LOP), the Quadratic Assignment Problem (QAP), the Permutation Flowshop Scheduling Problem (PFSP) and the Travelling Salesman Problem (TSP).

*J. Ceberio, E. Irurozki and J. A. Lozano are with the Intelligent Systems Group, Department of Computer Science and Artificial Intelligence, University of the Basque Country UPV/EHU, Donostia 20018, Gipuzkoa, Spain. {e-mail: josu.ceberio@ehu.es}

†A. Mendiburu is with the Intelligent Systems Group, Department of Computer Architecture and Technology, University of the Basque Country UPV/EHU, Donostia 20018, Gipuzkoa, Spain.

Table 1: Average $H(\epsilon)$ and $M(\epsilon)$ results of 300 adaptive walks of 1000 steps performed in the *swap*, *interchange* and *insert* landscapes.

Instances	*swap*		*interchange*		*insert*	
	$H(\epsilon)$	$M(\epsilon)$	$H(\epsilon)$	$M(\epsilon)$	$H(\epsilon)$	$M(\epsilon)$
Cebe.LOP.n10.1	0.2510	0.2301	0.1412	0.0846	0.1350	0.0860
Cebe.LOP.n20.1	0.1228	0.0679	0.0625	0.0268	0.0542	0.0235
Cebe.LOP.n30.1	0.0822	0.0382	0.0380	0.0147	0.0336	0.0127
Cebe.LOP.n40.1	0.0673	0.0294	0.0296	0.0110	0.0247	0.0080
Cebe.LOP.n50.1	0.0603	0.0256	0.0246	0.0090	0.0196	0.0070
Cebe.LOP.n60.1	0.0514	0.0210	0.0195	0.0070	0.0188	0.0068
Cebe.LOP.n70.1	0.0467	0.0187	0.0190	0.0068	0.0139	0.0050
Cebe.LOP.n80.1	0.0417	0.0154	0.0140	0.0050	0.0139	0.0050
Cebe.LOP.n90.1	0.0383	0.0148	0.0139	0.0050	0.0139	0.0050
Cebe.LOP.n100.1	0.0352	0.0134	0.0139	0.0040	0.0139	0.0050
Cebe.QAP.n10.1	0.2227	0.1746	0.1333	0.0813	0.1977	0.1324
Cebe.QAP.n20.1	0.1314	0.0714	0.0705	0.0321	0.1228	0.0659
Cebe.QAP.n30.1	0.0943	0.0454	0.0501	0.0214	0.0944	0.0464
Cebe.QAP.n40.1	0.0764	0.0345	0.0387	0.0150	0.0791	0.0371
Cebe.QAP.n50.1	0.0642	0.0277	0.0298	0.0111	0.0676	0.0295
Cebe.QAP.n60.1	0.0541	0.0234	0.0248	0.0101	0.0579	0.0243
Cebe.QAP.n70.1	0.0475	0.0201	0.0223	0.0091	0.0514	0.0220
Cebe.QAP.n80.1	0.0423	0.0166	0.0195	0.0070	0.0461	0.0194
Cebe.QAP.n90.1	0.0385	0.0149	0.0193	0.0079	0.0422	0.0176
Cebe.QAP.n100.1	0.0352	0.0134	0.0140	0.0051	0.0391	0.0152
Cebe.PFSP.n10.1	0.1584	0.1017	0.1115	0.0685	0.0881	0.0607
Cebe.PFSP.n20.1	0.0865	0.0407	0.0582	0.0246	0.0467	0.0190
Cebe.PFSP.n30.1	0.0636	0.0274	0.0391	0.0151	0.0312	0.0117
Cebe.PFSP.n40.1	0.0431	0.0171	0.0290	0.0108	0.0246	0.0090
Cebe.PFSP.n50.1	0.0340	0.0129	0.0233	0.0085	0.0195	0.0070
Cebe.PFSP.n60.1	0.0296	0.0120	0.0194	0.0080	0.0143	0.0061
Cebe.PFSP.n70.1	0.0195	0.0071	0.0145	0.0062	0.0139	0.0060
Cebe.PFSP.n80.1	0.0218	0.0079	0.0139	0.0050	0.0138	0.0050
Cebe.PFSP.n90.1	0.0174	0.0063	0.0138	0.0060	0.0104	0.0049
Cebe.PFSP.n100.1	0.0157	0.0057	0.0114	0.0042	0.0079	0.0031
Cebe.TSP.n10.1	0.2042	0.1505	0.1416	0.1018	0.1368	0.0973
Cebe.TSP.n20.1	0.1256	0.0697	0.0803	0.0407	0.0702	0.0328
Cebe.TSP.n30.1	0.0935	0.0458	0.0553	0.0251	0.0475	0.0203
Cebe.TSP.n40.1	0.0751	0.0350	0.0428	0.0181	0.0365	0.0142
Cebe.TSP.n50.1	0.0636	0.0275	0.0342	0.0131	0.0294	0.0110
Cebe.TSP.n60.1	0.0552	0.0240	0.0293	0.0120	0.0245	0.0100
Cebe.TSP.n70.1	0.0491	0.0210	0.0247	0.0101	0.0208	0.0085
Cebe.TSP.n80.1	0.0437	0.0183	0.0242	0.0098	0.0194	0.0080
Cebe.TSP.n90.1	0.0398	0.0165	0.0194	0.0080	0.0187	0.0078
Cebe.TSP.n100.1	0.0374	0.0154	0.0194	0.0080	0.0139	0.0060