Supplemental Results

Due to the space limitation, this section provides some additional experimental results and analysis that are not included in the main body of the paper.

0.1 Number of final selected features

Following the parameter settings in section 4.1 in the main body of the paper, the number of final selected features for all compared SFS methods and the SFS-DFC framework is summarized in Table 1. Since the ten-fold cross-validation is used, we reported the average number of selected features from each method in Table 1.

Datasets	Alpha-Investing	SAOLA	Fast-OSFS	OFS-Density	OFS-A3M	Group SAOLA	OGFS-FI	SFS-DFC
ALLMALL	14.62	20.83	5.17	4.89	15.82	14.45	13.63	57.12
Lung	3.58	9.75	2.86	5.40	21.55	8.71	12.91	64.00
Arcene	16.00	33.82	10.29	73.10	43.26	30.63	105.12	156.50
Orlraws10P	12.00	5.39	4.7	5.48	11.99	3.71	15.24	122.00
Pixraw10P	12.00	8.09	5.11	132.25	7.34	7.39	21.38	79.79
WarpPIE100	47.00	3.09	5.94	29.10	14.48	3.71	34.74	105.00
Lymphoma	4.09	15.12	7.42	8.60	27.90	18.57	46.05	266.30
COIL20	250.20	5.18	7.97	161.50	19.05	4.87	54.32	98.00
Colon	2.84	4.6	3.48	6.05	26.48	2.95	14.55	92.00
GIL-85	20.00	32.61	7.7	14.60	21.06	16.42	44.58	81.12
GILMO	4.12	15.99	5.43	8.80	23.92	12.71	57.47	112.20
SMK	4.22	4.37	5.11	12.29	18.89	5.09	23.12	264.30
Carcinom	27.00	41.46	13.65	39.46	38.54	29.78	109.41	106.60

Table 1: Average number of selected features from seven supervised SFS methods and the SFS-DFC framework.

Discussions. As shown in Table 1, SFS-DFC selects more features than the other seven supervised SFS methods. This can be explained by the fact that supervised SFS methods utilized the label information to filter out highly redundant and less relevant features. However, SFS-DFC is an unsupervised method and it only explore the group structure among features to select relevant features with high descriptive power and remove redundant features only based on the dependency among features. As an unsupervised method, it is reasonable that SFS-DFC selects more features to achieve better or comparable performance than the seven supervised SFS methods.