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Table 1: General statistics

metric	value
number of certificates number of plot coordinates number of failures fraction of failures mean absolute error (all p_T) mean absolute error ($p_T \ge p_S$)	9072 3360 150 0.044642857142857144 0.04854405987222857 0.008883532822442112

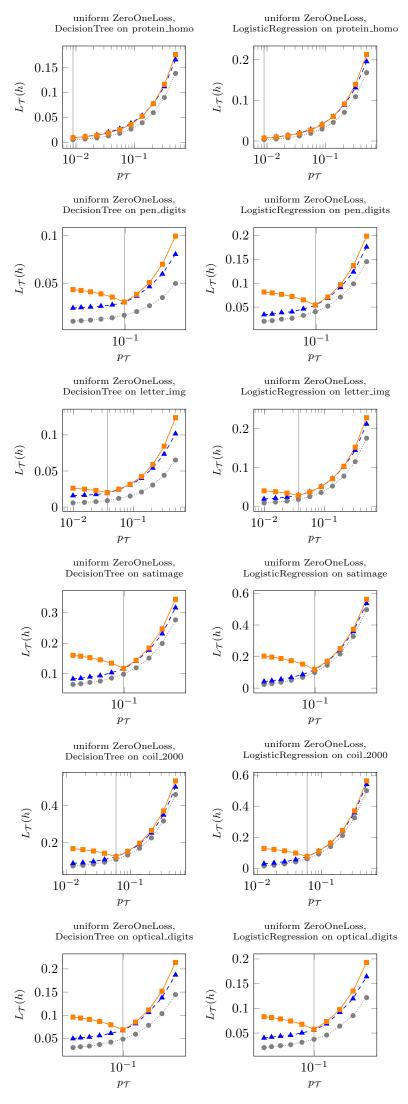


Figure 1: imblearn: uniform ZeroOneLoss with $\delta=0.01$

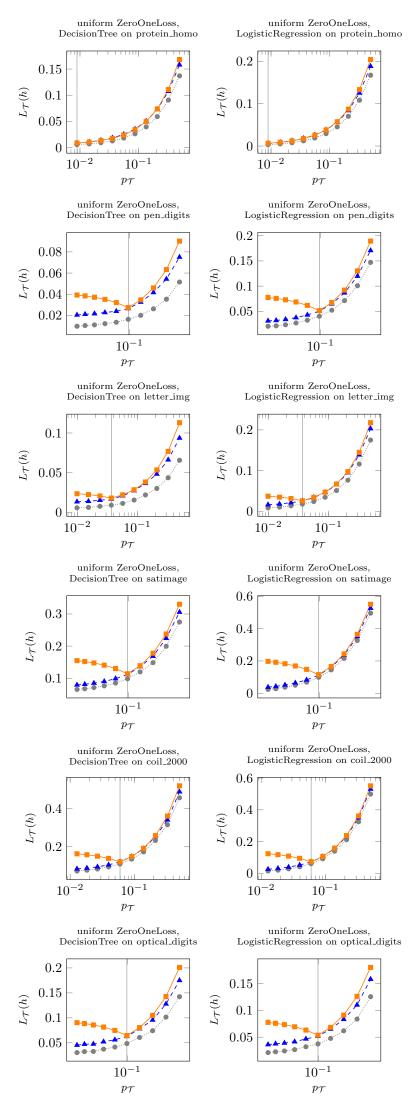


Figure 2: imblearn: uniform ZeroOneLoss with $\delta=0.05$

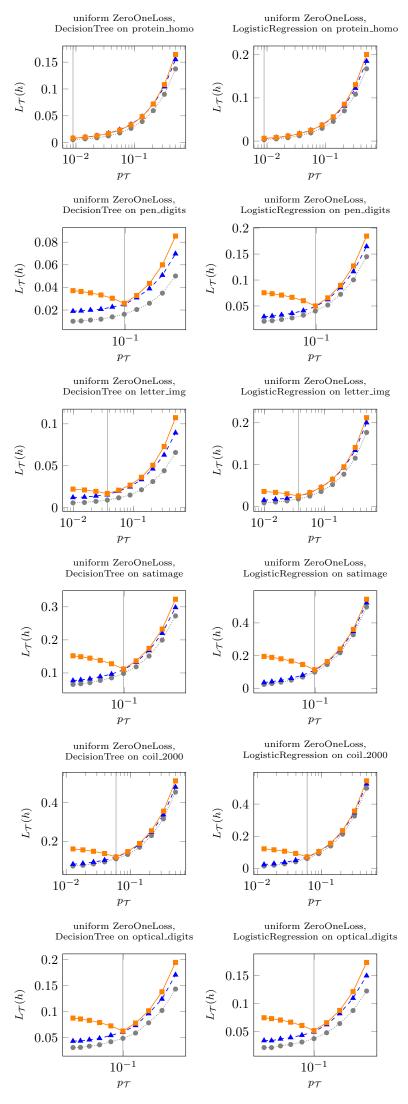


Figure 3: imblearn: uniform ZeroOneLoss with $\delta=0.1$

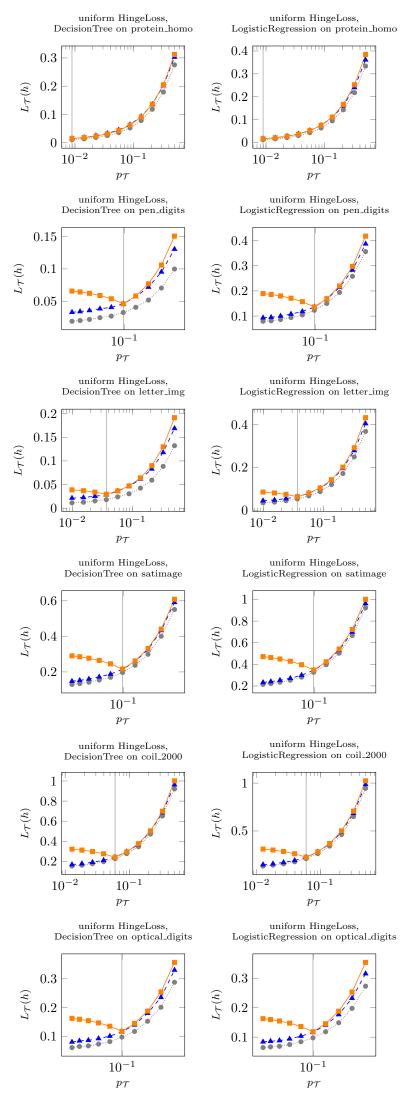


Figure 4: imblearn: uniform HingeLoss with $\delta=0.01$

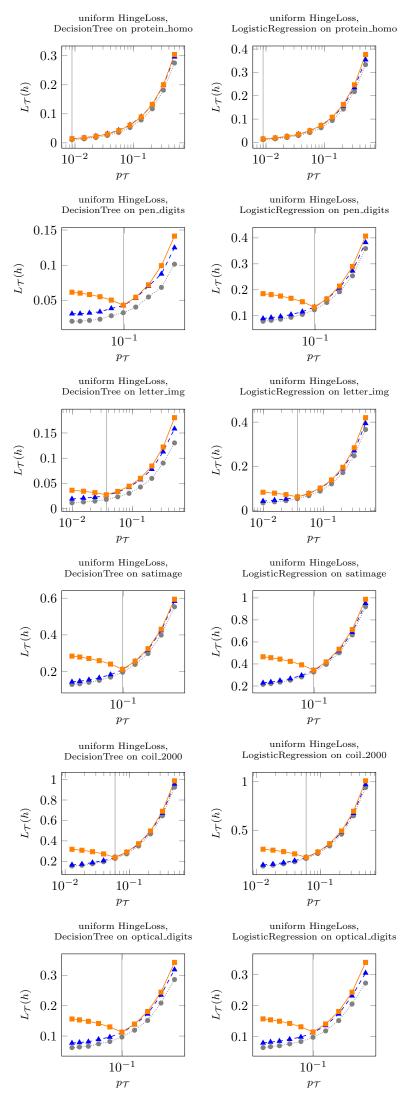


Figure 5: imblearn: uniform HingeLoss with $\delta=0.05$

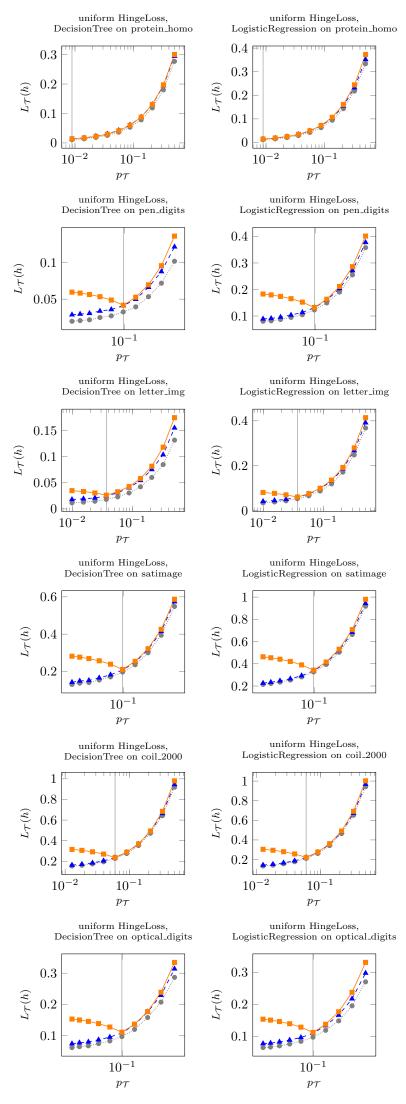


Figure 6: imblearn: uniform HingeLoss with $\delta=0.1$

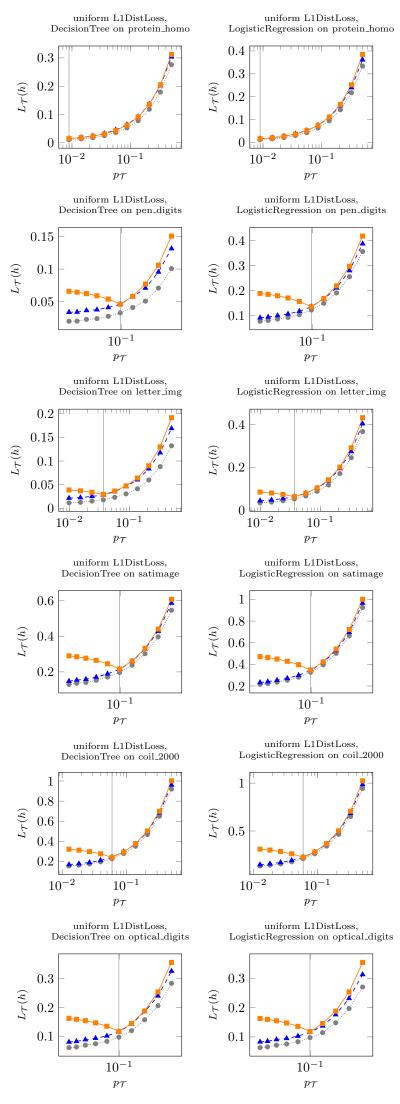


Figure 7: imblearn: uniform L1DistLoss with $\delta=0.01$

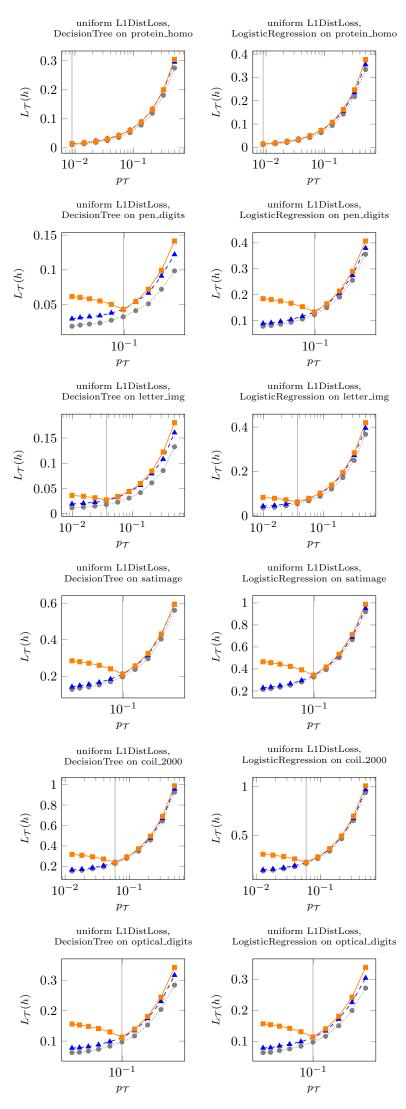


Figure 8: imblearn: uniform L1DistLoss with $\delta=0.05$

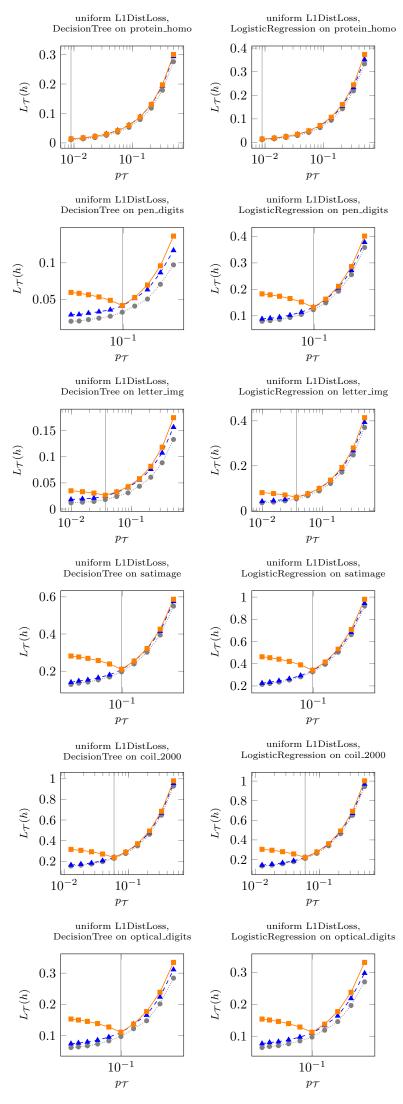


Figure 9: imblearn: uniform L1DistLoss with $\delta=0.1$

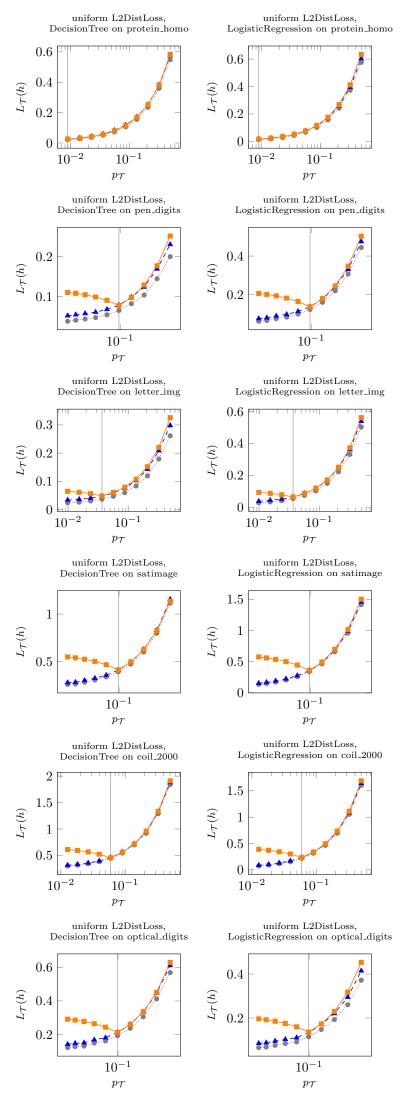


Figure 10: imblearn: uniform L2DistLoss with $\delta=0.01$

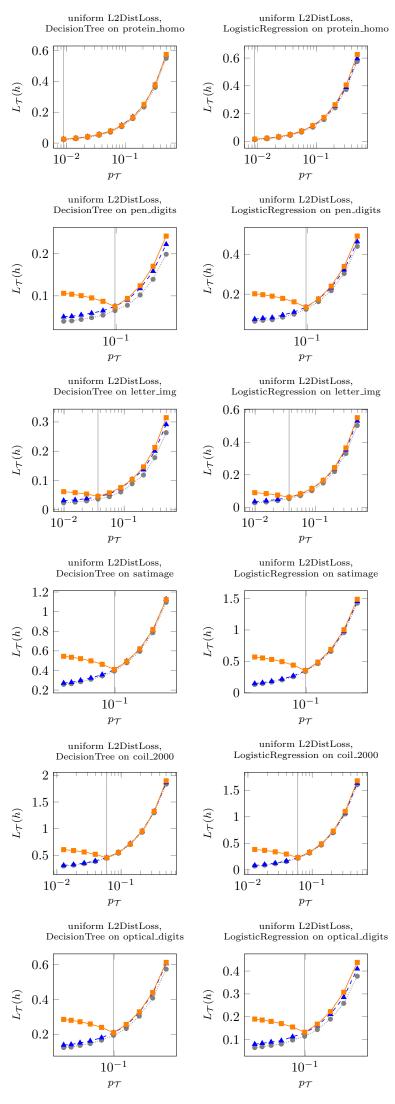


Figure 11: imblearn: uniform L2DistLoss with $\delta=0.05$

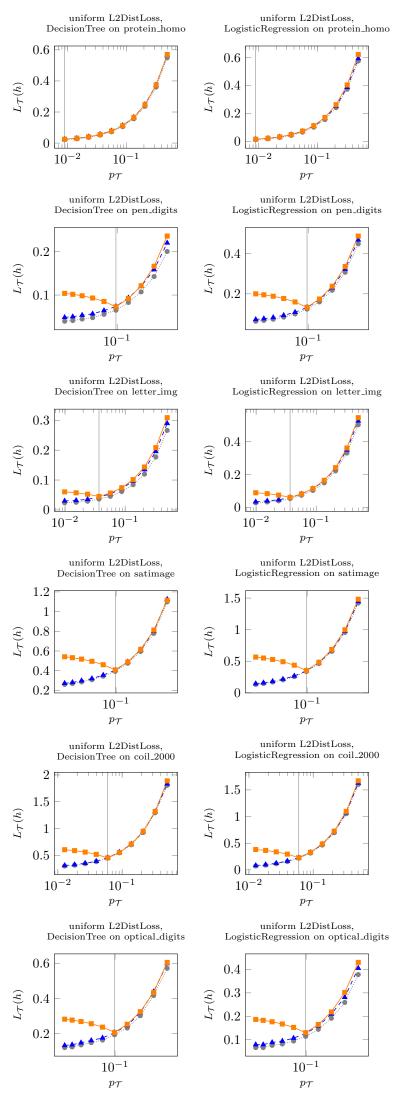


Figure 12: imblearn: uniform L2DistLoss with $\delta=0.1$

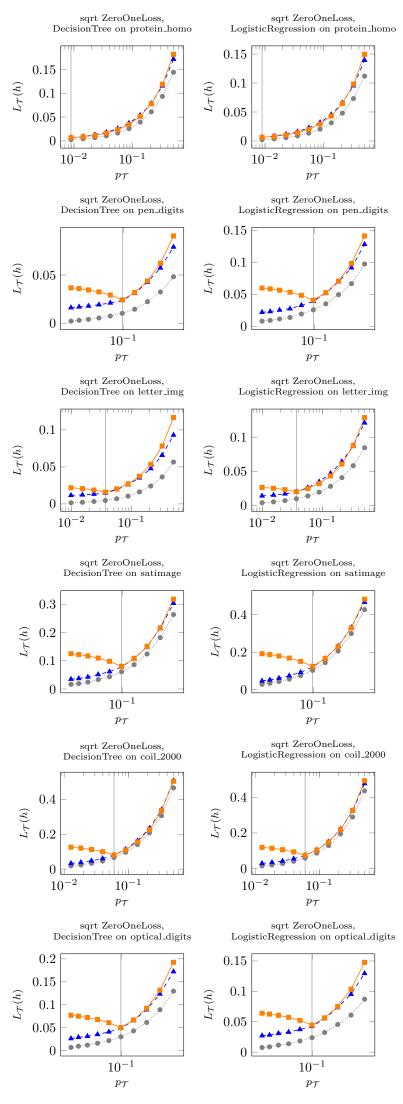


Figure 13: imblearn: sqrt ZeroOneLoss with $\delta=0.01$

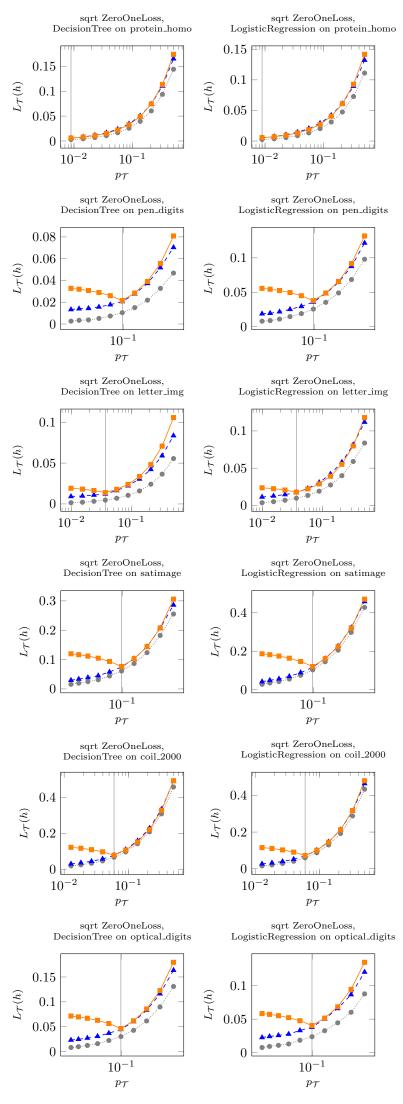


Figure 14: imblearn: sqrt ZeroOneLoss with $\delta=0.05$

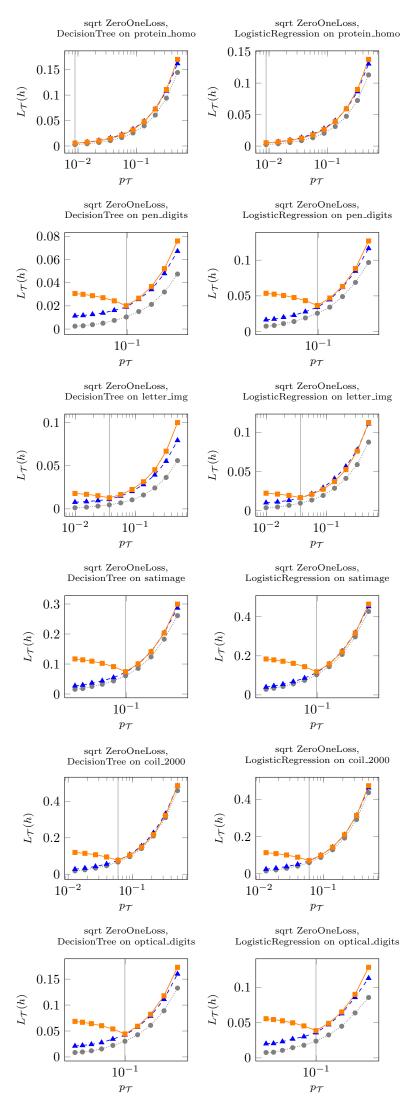


Figure 15: imblearn: sqrt ZeroOneLoss with $\delta=0.1$

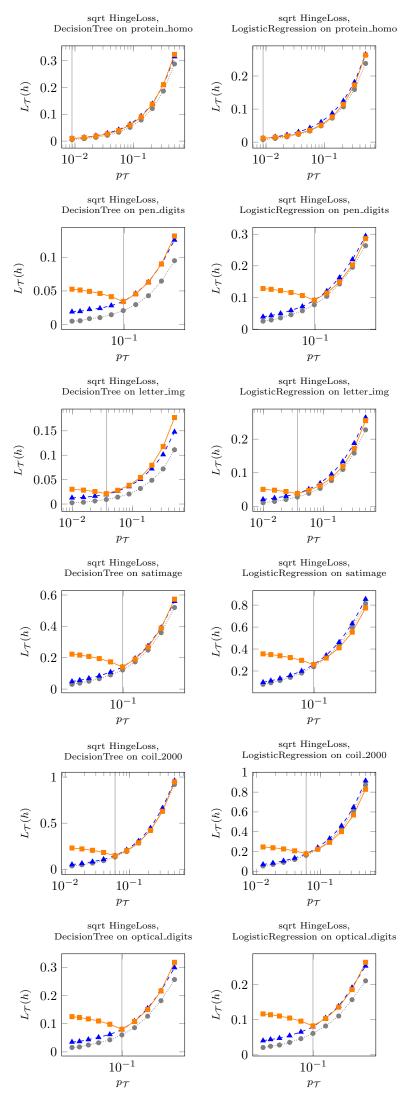


Figure 16: imblearn: sqrt HingeLoss with $\delta=0.01$

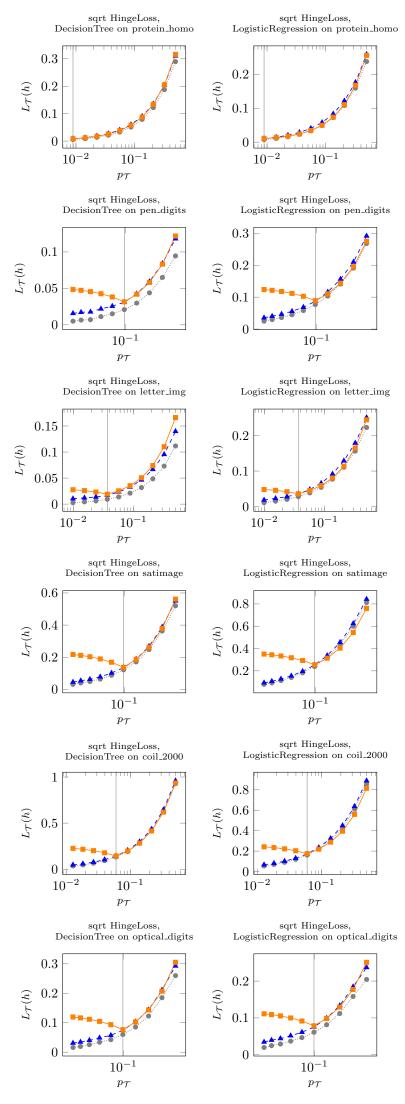


Figure 17: imblearn: sqrt HingeLoss with $\delta=0.05$

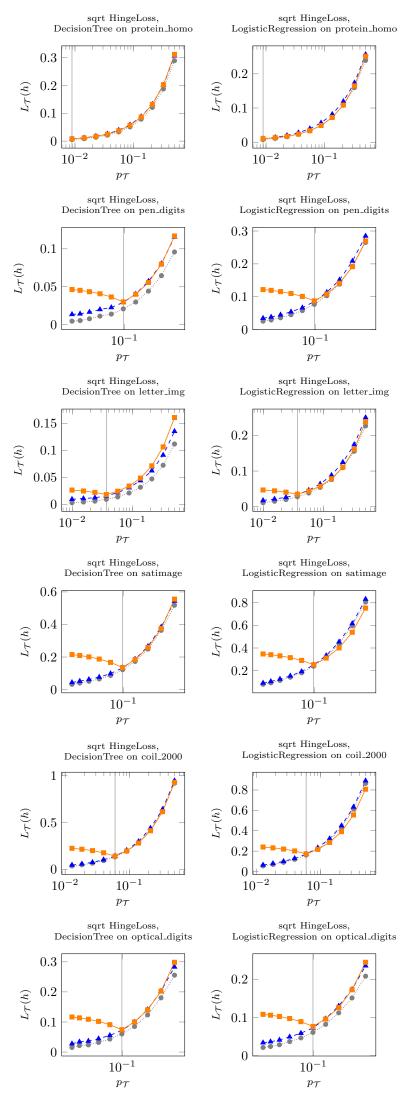


Figure 18: imblearn: sqrt HingeLoss with $\delta=0.1$

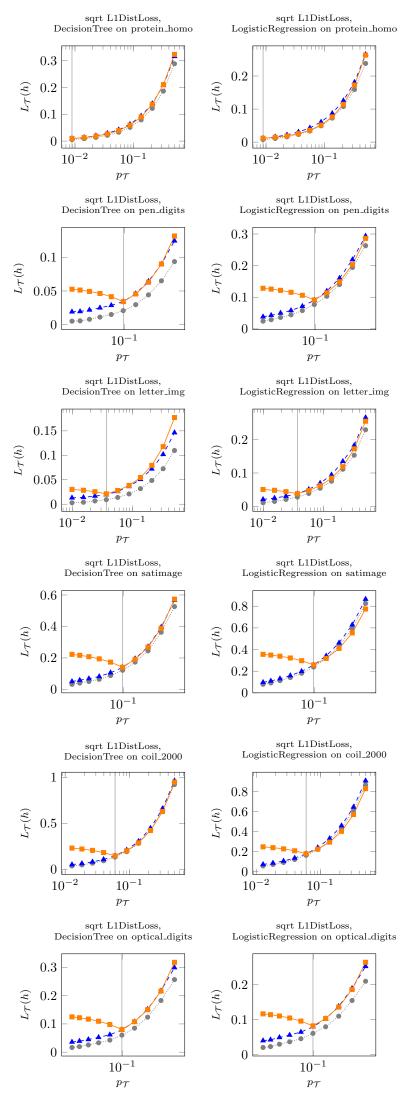


Figure 19: imblearn: sqrt L1DistLoss with $\delta=0.01$

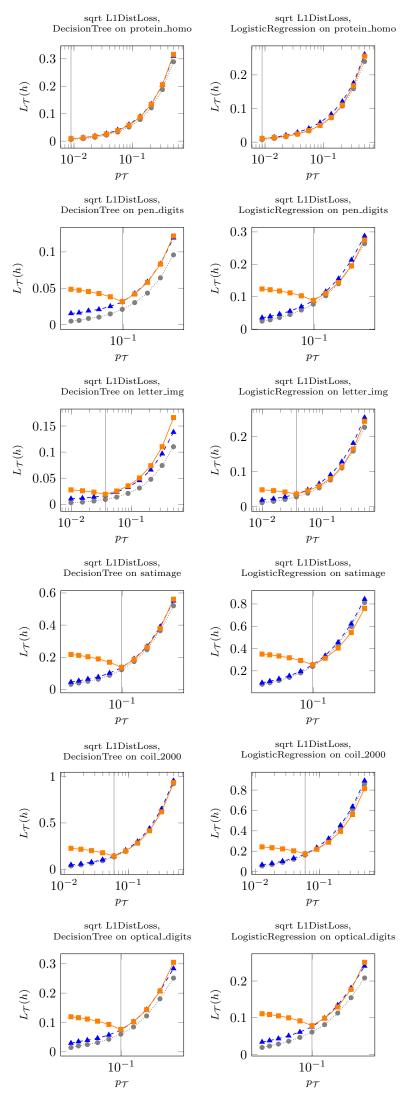


Figure 20: imblearn: sqrt L1DistLoss with $\delta=0.05$

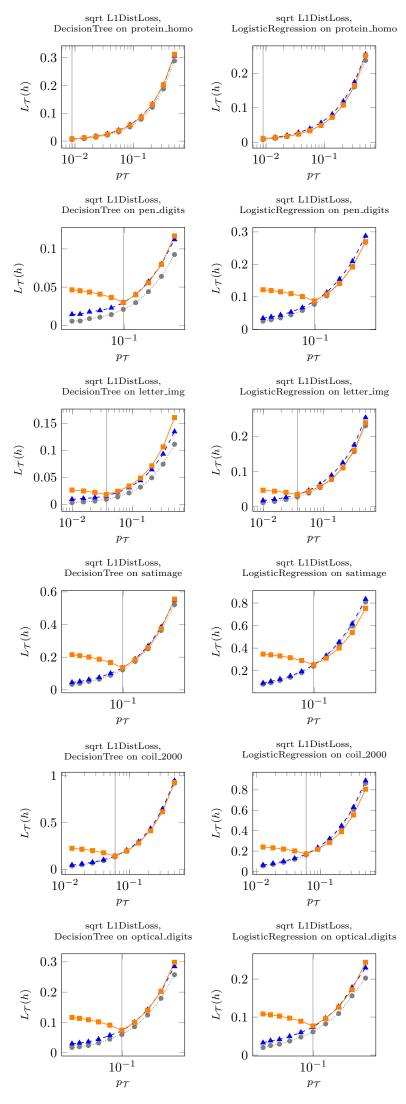


Figure 21: imblearn: sqrt L1DistLoss with $\delta=0.1$

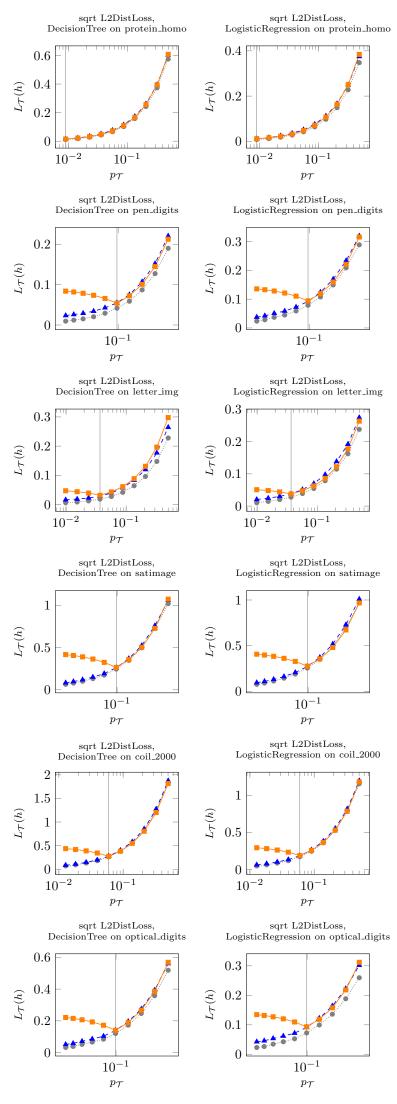


Figure 22: imblearn: sqrt L2DistLoss with $\delta=0.01$

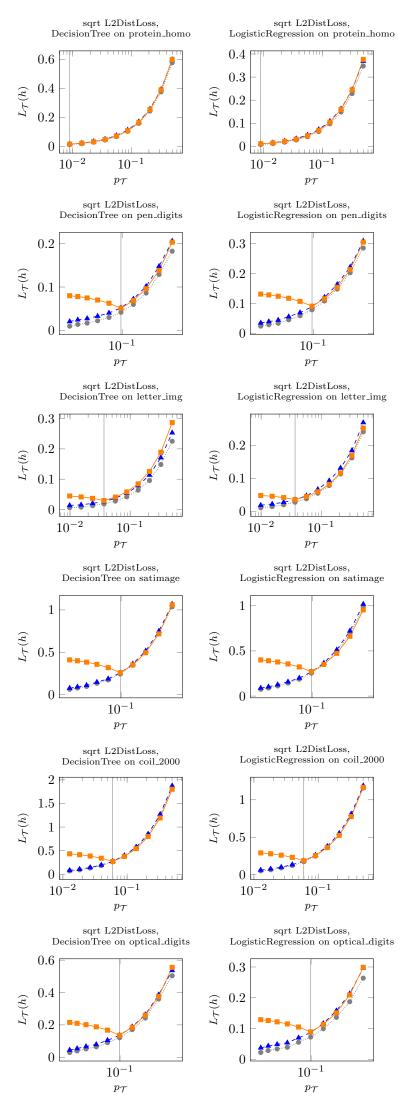


Figure 23: imblearn: sqrt L2DistLoss with $\delta=0.05$

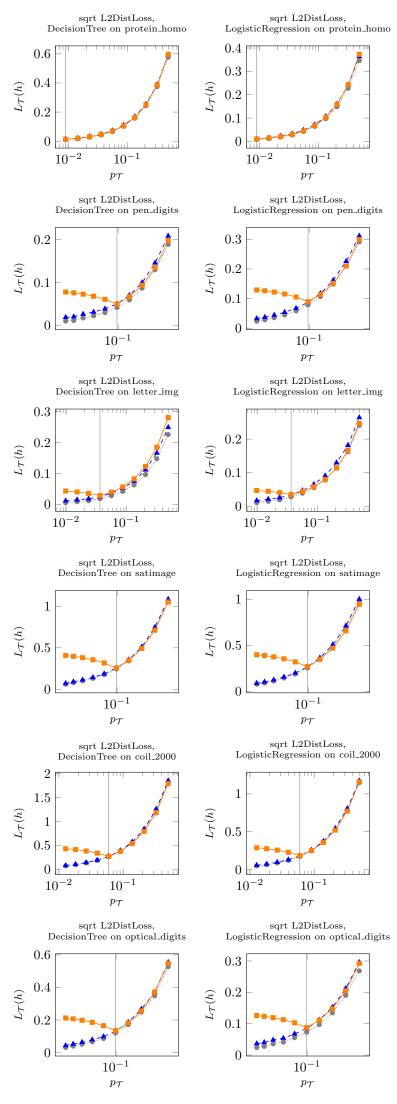


Figure 24: imblearn: sqrt L2DistLoss with $\delta=0.1$

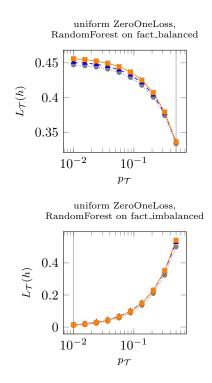


Figure 25: FACT: uniform ZeroOneLoss with $\delta=0.01$

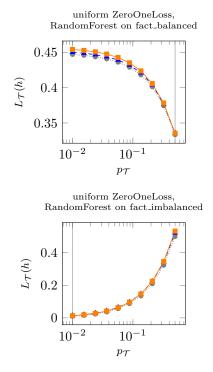


Figure 26: FACT: uniform ZeroOneLoss with $\delta=0.05$

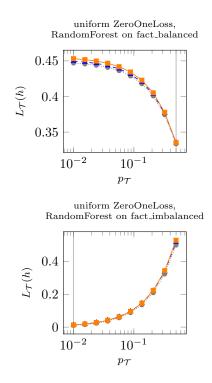


Figure 27: FACT: uniform ZeroOneLoss with $\delta=0.1$

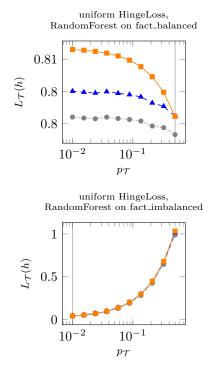


Figure 28: FACT: uniform HingeLoss with $\delta = 0.01$

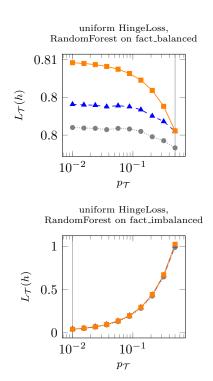


Figure 29: FACT: uniform HingeLoss with $\delta=0.05$

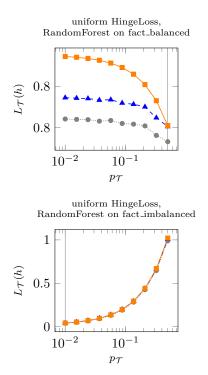


Figure 30: FACT: uniform HingeLoss with $\delta=0.1$

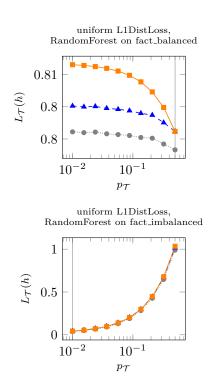


Figure 31: FACT: uniform L1DistLoss with $\delta=0.01$

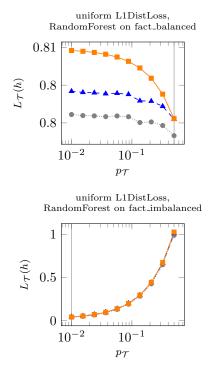


Figure 32: FACT: uniform L1DistLoss with $\delta = 0.05$

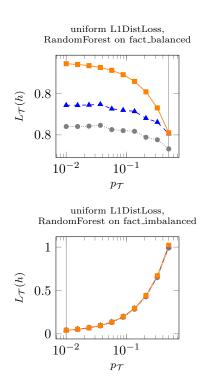


Figure 33: FACT: uniform L1DistLoss with $\delta=0.1$

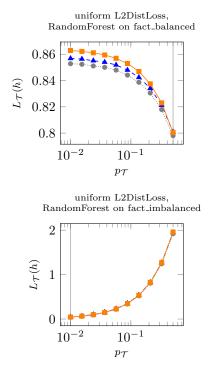


Figure 34: FACT: uniform L2DistLoss with $\delta=0.01$

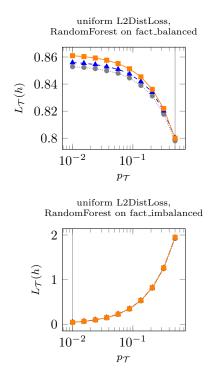


Figure 35: FACT: uniform L2DistLoss with $\delta=0.05$

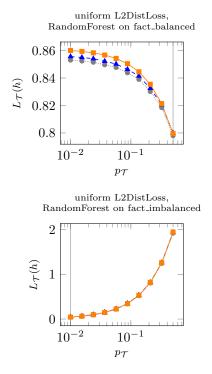


Figure 36: FACT: uniform L2DistLoss with $\delta=0.1$

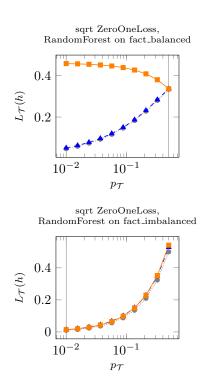


Figure 37: FACT: sqrt ZeroOneLoss with $\delta=0.01$

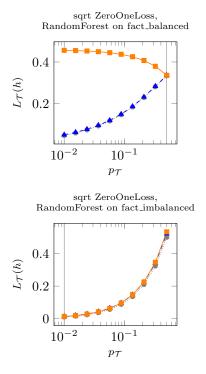


Figure 38: FACT: sqrt ZeroOneLoss with $\delta=0.05$

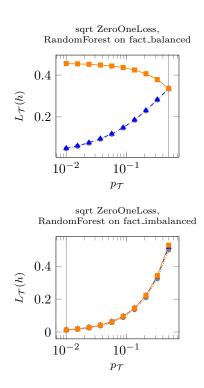


Figure 39: FACT: sqrt ZeroOneLoss with $\delta=0.1$

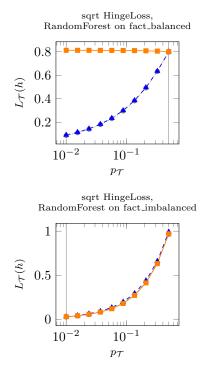


Figure 40: FACT: sqrt HingeLoss with $\delta=0.01$

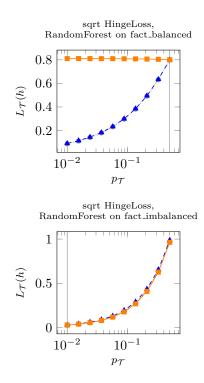


Figure 41: FACT: sqrt HingeLoss with $\delta = 0.05$

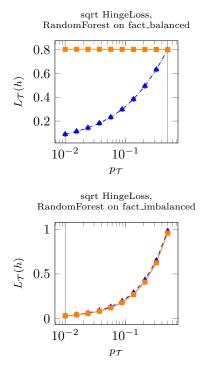


Figure 42: FACT: sqrt HingeLoss with $\delta=0.1$

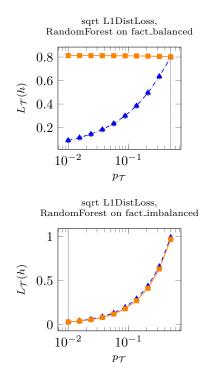


Figure 43: FACT: sqrt L1DistLoss with $\delta=0.01$

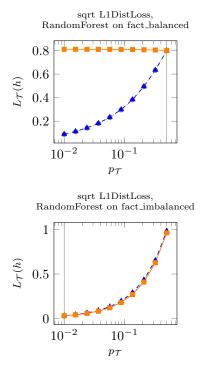


Figure 44: FACT: sqrt L1DistLoss with $\delta = 0.05$

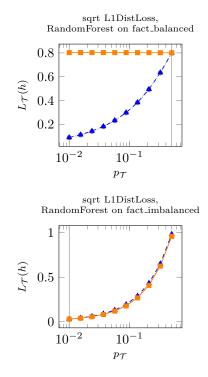


Figure 45: FACT: sqrt L1DistLoss with $\delta=0.1$

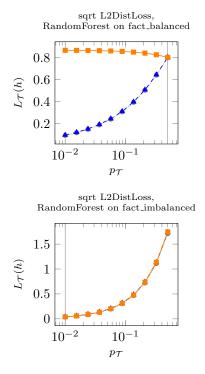


Figure 46: FACT: sqrt L2DistLoss with $\delta = 0.01$

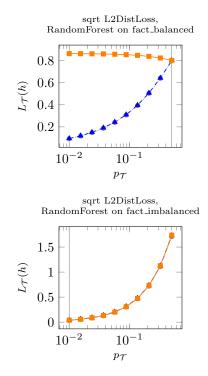


Figure 47: FACT: sqrt L2DistLoss with $\delta = 0.05$

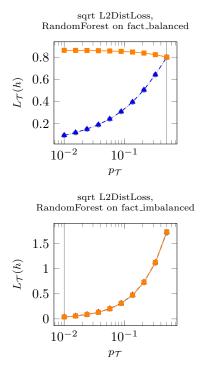


Figure 48: FACT: sqrt L2DistLoss with $\delta=0.1$

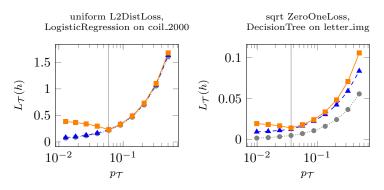


Figure 49: Fig. 4 in our paper

Table 2: uniform ZeroOneLoss with $\delta=0.01, \epsilon=0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0763	0.0597	0.0091
coil_2000	DecisionTree	0.1238	0.0597	0.0108
fact_balanced	RandomForest	0.3363	0.5	0.0409
fact_imbalanced	RandomForest	0.0144	0.01	0.0093
letter_img	LogisticRegression	0.0281	0.0367	0.0231
letter_img	DecisionTree	0.0201	0.0367	0.0446
optical_digits	LogisticRegression	0.0577	0.0986	0.0305
optical_digits	DecisionTree	0.0685	0.0986	0.0283
pen_digits	LogisticRegression	0.0543	0.096	0.0285
pen_digits	DecisionTree	0.0302	0.096	0.0594
protein_homo	LogisticRegression	0.0074	0.0089	0.0239
protein_homo	DecisionTree	0.0096	0.0089	0.0294
satimage	LogisticRegression	0.1188	0.0973	0.0093
satimage	DecisionTree	0.1175	0.0973	0.0182

Table 3: uniform ZeroOneLoss with $\delta=0.05, \epsilon=0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0733	0.0597	0.0093
coil_2000	DecisionTree	0.1208	0.0597	0.0111
$fact_balanced$	RandomForest	0.3357	0.5	0.0414
fact_imbalanced	RandomForest	0.0135	0.01	0.0094
letter_img	LogisticRegression	0.026	0.0367	0.0242
letter_img	DecisionTree	0.0181	0.0367	0.0488
optical_digits	LogisticRegression	0.0537	0.0986	0.0326
optical_digits	DecisionTree	0.0646	0.0986	0.0302
pen_digits	LogisticRegression	0.0515	0.096	0.0299
pen_digits	DecisionTree	0.0274	0.096	0.0656
protein_homo	LogisticRegression	0.0066	0.0089	0.0248
protein_homo	DecisionTree	0.0088	0.0089	0.0307
satimage	LogisticRegression	0.1151	0.0973	0.0095
satimage	DecisionTree	0.1139	0.0973	0.019

Table 4: uniform ZeroOneLoss with $\delta=0.1, \epsilon=0.01$

			,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0718	0.0597	0.0094
coil_2000	DecisionTree	0.1193	0.0597	0.0112
$fact_balanced$	RandomForest	0.3354	0.5	0.0416
$fact_imbalanced$	RandomForest	0.0131	0.01	0.0095
letter_img	LogisticRegression	0.025	0.0367	0.0247
letter_img	DecisionTree	0.017	0.0367	0.0512
optical_digits	LogisticRegression	0.0517	0.0986	0.0339
optical_digits	DecisionTree	0.0626	0.0986	0.0312
pen_digits	LogisticRegression	0.05	0.096	0.0306
pen_digits	DecisionTree	0.0259	0.096	0.0693
protein_homo	LogisticRegression	0.0062	0.0089	0.0252
protein_homo	DecisionTree	0.0084	0.0089	0.0314
satimage	LogisticRegression	0.1132	0.0973	0.0096
satimage	DecisionTree	0.112	0.0973	0.0195
_				

Table 5: uniform HingeLoss with $\delta = 0.01, \epsilon = 0.01$

O		,	
classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
LogisticRegression	0.2262	0.0597	0.0056
DecisionTree	0.2414	0.0597	0.0058
RandomForest	0.8012	0.5	0.4725
RandomForest	0.0435	0.01	0.0049
LogisticRegression	0.0633	0.0367	0.0126
DecisionTree	0.0295	0.0367	0.0286
LogisticRegression	0.1183	0.0986	0.0175
DecisionTree	0.1168	0.0986	0.0172
LogisticRegression	0.1363	0.096	0.0146
DecisionTree	0.0459	0.096	0.0393
LogisticRegression	0.0161	0.0089	0.0133
DecisionTree	0.0152	0.0089	0.0165
LogisticRegression	0.3474	0.0973	0.0063
DecisionTree	0.2162	0.0973	0.0105
	LogisticRegression DecisionTree RandomForest RandomForest LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree	LogisticRegression 0.2262 DecisionTree 0.2414 RandomForest 0.8012 RandomForest 0.0435 LogisticRegression 0.0633 DecisionTree 0.0295 LogisticRegression 0.1183 DecisionTree 0.1168 LogisticRegression 0.1363 DecisionTree 0.0459 LogisticRegression 0.0161 DecisionTree 0.0152 LogisticRegression 0.3474	LogisticRegression 0.2262 0.0597 DecisionTree 0.2414 0.0597 RandomForest 0.8012 0.5 RandomForest 0.0435 0.01 LogisticRegression 0.0633 0.0367 DecisionTree 0.0295 0.0367 LogisticRegression 0.1183 0.0986 DecisionTree 0.1168 0.0986 LogisticRegression 0.1363 0.096 LogisticRegression 0.0459 0.096 LogisticRegression 0.0161 0.0089 DecisionTree 0.0152 0.0089 LogisticRegression 0.3474 0.0973

Table 6: uniform HingeLoss with $\delta = 0.05, \epsilon = 0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2232	0.0597	0.0056
coil_2000	DecisionTree	0.2384	0.0597	0.0059
fact_balanced	RandomForest	0.8006	0.5	0.5428
$fact_{imbalanced}$	RandomForest	0.0427	0.01	0.005
letter_img	LogisticRegression	0.0612	0.0367	0.0129
letter_img	DecisionTree	0.0275	0.0367	0.0303
optical_digits	LogisticRegression	0.1144	0.0986	0.0184
optical_digits	DecisionTree	0.1129	0.0986	0.018
pen_digits	LogisticRegression	0.1335	0.096	0.0151
pen_digits	DecisionTree	0.0431	0.096	0.0419
protein_homo	LogisticRegression	0.0153	0.0089	0.0136
protein_homo	DecisionTree	0.0144	0.0089	0.0169
satimage	LogisticRegression	0.3437	0.0973	0.0064
satimage	DecisionTree	0.2125	0.0973	0.0108

Table 7: uniform HingeLoss with $\delta = 0.1, \epsilon = 0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2217	0.0597	0.0057
coil_2000	DecisionTree	0.2369	0.0597	0.006
$fact_balanced$	RandomForest	0.8003	0.5	0.5865
fact_imbalanced	RandomForest	0.0422	0.01	0.005
letter_img	LogisticRegression	0.0601	0.0367	0.0131
letter_img	DecisionTree	0.0264	0.0367	0.0312
optical_digits	LogisticRegression	0.1124	0.0986	0.0188
optical_digits	DecisionTree	0.1109	0.0986	0.0184
pen_digits	LogisticRegression	0.132	0.096	0.0153
pen_digits	DecisionTree	0.0417	0.096	0.0434
protein_homo	LogisticRegression	0.0149	0.0089	0.0137
protein_homo	DecisionTree	0.014	0.0089	0.0171
satimage	LogisticRegression	0.3418	0.0973	0.0065
satimage	DecisionTree	0.2106	0.0973	0.0109

Table 8: uniform L1DistLoss with $\delta = 0.01, \epsilon = 0.01$

			0.0-, 0	0.0-
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2262	0.0597	0.0056
coil_2000	DecisionTree	0.2414	0.0597	0.0058
$fact_balanced$	RandomForest	0.8012	0.5	0.4725
fact_imbalanced	RandomForest	0.0435	0.01	0.0049
letter_img	LogisticRegression	0.0633	0.0367	0.0126
letter_img	DecisionTree	0.0295	0.0367	0.0286
optical_digits	LogisticRegression	0.1183	0.0986	0.0175
optical_digits	DecisionTree	0.1168	0.0986	0.0172
pen_digits	LogisticRegression	0.1363	0.096	0.0146
pen_digits	DecisionTree	0.0459	0.096	0.0393
protein_homo	LogisticRegression	0.0161	0.0089	0.0133
protein_homo	DecisionTree	0.0152	0.0089	0.0165
satimage	LogisticRegression	0.3474	0.0973	0.0063
satimage	DecisionTree	0.2162	0.0973	0.0105

Table 9: uniform L1DistLoss with $\delta = 0.05, \epsilon = 0.01$

10010 0. 01111	01111 212 10 02 000 1		0.00,0	0.01
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2232	0.0597	0.0056
coil_2000	DecisionTree	0.2384	0.0597	0.0059
$fact_balanced$	RandomForest	0.8006	0.5	0.5428
$fact_imbalanced$	RandomForest	0.0427	0.01	0.005
letter_img	LogisticRegression	0.0612	0.0367	0.0129
letter_img	DecisionTree	0.0275	0.0367	0.0303
optical_digits	LogisticRegression	0.1144	0.0986	0.0184
optical_digits	DecisionTree	0.1129	0.0986	0.018
pen_digits	LogisticRegression	0.1335	0.096	0.0151
pen_digits	DecisionTree	0.0431	0.096	0.0419
protein_homo	LogisticRegression	0.0153	0.0089	0.0136
protein_homo	DecisionTree	0.0144	0.0089	0.0169
satimage	LogisticRegression	0.3437	0.0973	0.0064
satimage	DecisionTree	0.2125	0.0973	0.0108

Table 10: uniform L1DistLoss with $\delta = 0.1, \epsilon = 0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2217	0.0597	0.0057
coil_2000	DecisionTree	0.2369	0.0597	0.006
fact_balanced	RandomForest	0.8003	0.5	0.5865
fact_imbalanced	RandomForest	0.0422	0.01	0.005
letter_img	LogisticRegression	0.0601	0.0367	0.0131
letter_img	DecisionTree	0.0264	0.0367	0.0312
optical_digits	LogisticRegression	0.1124	0.0986	0.0188
optical_digits	DecisionTree	0.1109	0.0986	0.0184
pen_digits	LogisticRegression	0.132	0.096	0.0153
pen_digits	DecisionTree	0.0417	0.096	0.0434
protein_homo	LogisticRegression	0.0149	0.0089	0.0137
protein_homo	DecisionTree	0.014	0.0089	0.0171
satimage	LogisticRegression	0.3418	0.0973	0.0065
satimage	DecisionTree	0.2106	0.0973	0.0109

Table 11: uniform L2DistLoss with $\delta = 0.01, \epsilon = 0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2346	0.0597	0.003
coil_2000	DecisionTree	0.4576	0.0597	0.003
$fact_balanced$	RandomForest	0.8006	0.5	0.0786
fact_imbalanced	RandomForest	0.0445	0.01	0.0026
letter_img	LogisticRegression	0.0639	0.0367	0.0093
letter_img	DecisionTree	0.0483	0.0367	0.0167
optical_digits	LogisticRegression	0.1359	0.0986	0.013
optical_digits	DecisionTree	0.2133	0.0986	0.0099
pen_digits	LogisticRegression	0.1372	0.096	0.0113
pen_digits	DecisionTree	0.0773	0.096	0.0236
protein_homo	LogisticRegression	0.0161	0.0089	0.0079
protein_homo	DecisionTree	0.0264	0.0089	0.0088
satimage	LogisticRegression	0.3575	0.0973	0.0036
satimage	DecisionTree	0.4134	0.0973	0.0057

Table 12: uniform L2DistLoss with $\delta = 0.05, \epsilon = 0.01$

			,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000 coil_2000 fact_balanced fact_imbalanced letter_img letter_img optical_digits optical_digits	Classifier LogisticRegression DecisionTree RandomForest RandomForest LogisticRegression DecisionTree LogisticRegression DecisionTree	$L_{\mathcal{S}}(h)$ 0.2317 0.4547 0.8 0.0436 0.0618 0.0463 0.132 0.2094	<i>Ps</i> 0.0597 0.0597 0.5 0.01 0.0367 0.0367 0.0986 0.0986	Δp^* 0.0031 0.0031 0.0803 0.0026 0.0095 0.0173 0.0135 0.0102
optical_digits pen_digits pen_digits protein_homo protein_homo satimage satimage	LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression	0.2094 0.1344 0.0745 0.0154 0.0256 0.3538 0.4098	0.0986 0.096 0.096 0.0089 0.0089 0.0973	0.0102 0.0115 0.0247 0.008 0.0089 0.0036 0.0058

Table 13: uniform L2DistLoss with $\delta = 0.1, \epsilon = 0.01$

			,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2301	0.0597	0.0031
coil_2000	DecisionTree	0.4532	0.0597	0.0031
$fact_balanced$	RandomForest	0.7996	0.5	0.0812
$fact_imbalanced$	RandomForest	0.0432	0.01	0.0026
letter_img	LogisticRegression	0.0607	0.0367	0.0095
letter_img	DecisionTree	0.0452	0.0367	0.0176
optical_digits	LogisticRegression	0.1299	0.0986	0.0137
optical_digits	DecisionTree	0.2074	0.0986	0.0104
pen_digits	LogisticRegression	0.1329	0.096	0.0116
pen_digits	DecisionTree	0.0731	0.096	0.0253
protein_homo	LogisticRegression	0.015	0.0089	0.0081
protein_homo	DecisionTree	0.0252	0.0089	0.009
satimage	LogisticRegression	0.352	0.0973	0.0036
satimage	DecisionTree	0.4079	0.0973	0.0058

Table 14: <u>sqrt ZeroOneLoss with $\delta = 0.01, \epsilon = 0.01$ </u>

classifier isticRegression DecisionTree RandomForest RandomForest	$L_{\mathcal{S}}(h)$ 0.0752 0.0808 0.3365 0.0144	<i>ps</i> 0.0597 0.0597 0.5 0.01	Δp^* 0.0106 0.0105 0.0403
DecisionTree RandomForest RandomForest	$0.0808 \\ 0.3365$	$0.0597 \\ 0.5$	0.0105
RandomForest RandomForest	0.3365	0.5	
RandomForest	0.000	0.0	0.0403
	0.0144	0.01	
! - 4 ! - D !		0.01	0.0093
isticRegression	0.0199	0.0367	0.0426
DecisionTree	0.016	0.0367	0.046
isticRegression	0.0445	0.0986	0.0399
DecisionTree	0.0502	0.0986	0.029
isticRegression	0.0408	0.096	0.0411
DecisionTree	0.0244	0.096	0.0625
isticRegression	0.0064	0.0089	0.0343
DecisionTree	0.0068	0.0089	0.028
isticRegression	0.1241	0.0973	0.0115
DecisionTree	0.08	0.0973	0.0173
	isticRegression DecisionTree isticRegression DecisionTree isticRegression DecisionTree isticRegression	isticRegression 0.0445 DecisionTree 0.0502 isticRegression 0.0448 DecisionTree 0.0244 isticRegression 0.0064 DecisionTree 0.0068 isticRegression 0.1241	isticRegression 0.0445 0.0986 DecisionTree 0.0502 0.0986 isticRegression 0.0408 0.096 DecisionTree 0.0244 0.096 isticRegression 0.0064 0.0089 DecisionTree 0.0068 0.0089 isticRegression 0.1241 0.0973

Table 15: sqrt ZeroOneLoss with $\delta=0.05, \epsilon=0.01$ (Tab. 1 in our paper)

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0722	0.0597	0.0109
coil_2000	DecisionTree	0.0778	0.0597	0.0107
$fact_balanced$	RandomForest	0.3359	0.5	0.0407
$fact_imbalanced$	RandomForest	0.0135	0.01	0.0094
letter_img	LogisticRegression	0.0179	0.0367	0.0463
letter_img	DecisionTree	0.0139	0.0367	0.0504
optical_digits	LogisticRegression	0.0406	0.0986	0.0437
optical_digits	DecisionTree	0.0463	0.0986	0.0309
pen_digits	LogisticRegression	0.038	0.096	0.044
pen_digits	DecisionTree	0.0216	0.096	0.0695
protein_homo	LogisticRegression	0.0056	0.0089	0.036
protein_homo	DecisionTree	0.006	0.0089	0.0291
satimage	LogisticRegression	0.1205	0.0973	0.0118
satimage	DecisionTree	0.0763	0.0973	0.018

Table 16: sqrt ZeroOneLoss with $\delta = 0.1, \epsilon = 0.01$

			0, -	0.0-
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0707	0.0597	0.011
coil_2000	DecisionTree	0.0763	0.0597	0.0108
$fact_balanced$	RandomForest	0.3356	0.5	0.041
fact_imbalanced	RandomForest	0.0131	0.01	0.0095
letter_img	LogisticRegression	0.0168	0.0367	0.0485
letter_img	DecisionTree	0.0128	0.0367	0.053
optical_digits	LogisticRegression	0.0385	0.0986	0.0459
optical_digits	DecisionTree	0.0443	0.0986	0.0321
pen_digits	LogisticRegression	0.0365	0.096	0.0456
pen_digits	DecisionTree	0.0201	0.096	0.0738
protein_homo	LogisticRegression	0.0052	0.0089	0.037
protein_homo	DecisionTree	0.0056	0.0089	0.0298
satimage	LogisticRegression	0.1186	0.0973	0.0119
satimage	DecisionTree	0.0744	0.0973	0.0183

Table 17: sqrt HingeLoss with $\delta = 0.01, \epsilon = 0.01$

classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*	
LogisticRegression	0.1776	0.0597	0.0068	
DecisionTree	0.1457	0.0597	0.0055	
RandomForest	0.8014	0.5	0.4438	
RandomForest	0.0317	0.01	0.0052	
LogisticRegression	0.0381	0.0367	0.0213	
DecisionTree	0.0212	0.0367	0.0297	
LogisticRegression	0.0824	0.0986	0.0227	
DecisionTree	0.0801	0.0986	0.0173	
LogisticRegression	0.0916	0.096	0.0212	
DecisionTree	0.0342	0.096	0.0424	
LogisticRegression	0.0117	0.0089	0.0195	
DecisionTree	0.0096	0.0089	0.0156	
LogisticRegression	0.2584	0.0973	0.008	
DecisionTree	0.141	0.0973	0.0095	
	LogisticRegression DecisionTree RandomForest RandomForest LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree	LogisticRegression 0.1776 DecisionTree 0.1457 RandomForest 0.8014 RandomForest 0.0317 LogisticRegression 0.0381 DecisionTree 0.0824 DecisionTree 0.0801 LogisticRegression 0.0916 DecisionTree 0.0342 LogisticRegression 0.0117 DecisionTree 0.0096 LogisticRegression 0.2584	LogisticRegression 0.1776 0.0597 DecisionTree 0.1457 0.0597 RandomForest 0.8014 0.5 RandomForest 0.0317 0.01 LogisticRegression 0.0381 0.0367 LogisticRegression 0.0824 0.0986 DecisionTree 0.0801 0.0986 LogisticRegression 0.0916 0.096 DecisionTree 0.0342 0.096 LogisticRegression 0.0117 0.0089 DecisionTree 0.0096 0.0089 LogisticRegression 0.2584 0.0973	

Table 18: sqrt HingeLoss with $\delta=0.05, \epsilon=0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1746	0.0597	0.0069
coil_2000	DecisionTree	0.1427	0.0597	0.0056
fact_balanced	RandomForest	0.8008	0.5	0.5057
fact_imbalanced	RandomForest	0.0308	0.01	0.0053
letter_img	LogisticRegression	0.036	0.0367	0.0222
letter_img	DecisionTree	0.0192	0.0367	0.0315
optical_digits	LogisticRegression	0.0785	0.0986	0.0239
optical_digits	DecisionTree	0.0762	0.0986	0.018
pen_digits	LogisticRegression	0.0888	0.096	0.0221
pen_digits	DecisionTree	0.0314	0.096	0.0456
protein_homo	LogisticRegression	0.0109	0.0089	0.02
protein_homo	DecisionTree	0.0088	0.0089	0.0159
satimage	LogisticRegression	0.2547	0.0973	0.0082
satimage	DecisionTree	0.1374	0.0973	0.0097

Table 19: sqrt HingeLoss with $\delta = 0.1, \epsilon = 0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1731	0.0597	0.007
coil_2000	DecisionTree	0.1412	0.0597	0.0056
$fact_balanced$	RandomForest	0.8005	0.5	1.6583
fact_imbalanced	RandomForest	0.0304	0.01	0.0053
letter_img	LogisticRegression	0.035	0.0367	0.0227
letter_img	DecisionTree	0.0181	0.0367	0.0325
optical_digits	LogisticRegression	0.0765	0.0986	0.0246
optical_digits	DecisionTree	0.0742	0.0986	0.0184
pen_digits	LogisticRegression	0.0873	0.096	0.0226
pen_digits	DecisionTree	0.03	0.096	0.0474
protein_homo	LogisticRegression	0.0106	0.0089	0.0203
protein_homo	DecisionTree	0.0084	0.0089	0.0161
satimage	LogisticRegression	0.2529	0.0973	0.0082
satimage	DecisionTree	0.1355	0.0973	0.0098

Table 20: sqrt L1DistLoss with $\delta = 0.01, \epsilon = 0.01$

	110 212 1002 000 111	011 0 0	, .	0.01
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1776	0.0597	0.0068
coil_2000	DecisionTree	0.1457	0.0597	0.0055
$fact_balanced$	RandomForest	0.8014	0.5	0.4438
fact_imbalanced	RandomForest	0.0317	0.01	0.0052
letter_img	LogisticRegression	0.0381	0.0367	0.0213
letter_img	DecisionTree	0.0212	0.0367	0.0297
optical_digits	LogisticRegression	0.0824	0.0986	0.0227
optical_digits	DecisionTree	0.0801	0.0986	0.0173
pen_digits	LogisticRegression	0.0916	0.096	0.0212
pen_digits	DecisionTree	0.0342	0.096	0.0424
protein_homo	LogisticRegression	0.0117	0.0089	0.0195
protein_homo	DecisionTree	0.0096	0.0089	0.0156
satimage	LogisticRegression	0.2584	0.0973	0.008
satimage	DecisionTree	0.141	0.0973	0.0095

Table 21: sqrt L1DistLoss with $\delta = 0.05, \epsilon = 0.01$

10010 21. 00	110 212 1002 000 111	011 0 0	, .	0.01
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1746	0.0597	0.0069
coil_2000	DecisionTree	0.1427	0.0597	0.0056
$fact_balanced$	RandomForest	0.8008	0.5	0.5057
fact_imbalanced	RandomForest	0.0308	0.01	0.0053
letter_img	LogisticRegression	0.036	0.0367	0.0222
letter_img	DecisionTree	0.0192	0.0367	0.0315
optical_digits	LogisticRegression	0.0785	0.0986	0.0239
optical_digits	DecisionTree	0.0762	0.0986	0.018
pen_digits	LogisticRegression	0.0888	0.096	0.0221
pen_digits	DecisionTree	0.0314	0.096	0.0456
protein_homo	LogisticRegression	0.0109	0.0089	0.02
protein_homo	DecisionTree	0.0088	0.0089	0.0159
satimage	LogisticRegression	0.2547	0.0973	0.0082
satimage	DecisionTree	0.1374	0.0973	0.0097

Table 22: sqrt L1DistLoss with $\delta=0.1, \epsilon=0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1731	0.0597	0.007
coil_2000	DecisionTree	0.1412	0.0597	0.0056
fact_balanced	RandomForest	0.8005	0.5	2.4769
fact_imbalanced	RandomForest	0.0304	0.01	0.0053
letter_img	LogisticRegression	0.035	0.0367	0.0227
letter_img	DecisionTree	0.0181	0.0367	0.0325
optical_digits	LogisticRegression	0.0765	0.0986	0.0246
optical_digits	DecisionTree	0.0742	0.0986	0.0184
pen_digits	LogisticRegression	0.0873	0.096	0.0226
pen_digits	DecisionTree	0.03	0.096	0.0474
protein_homo	LogisticRegression	0.0106	0.0089	0.0203
protein_homo	DecisionTree	0.0084	0.0089	0.0161
satimage	LogisticRegression	0.2529	0.0973	0.0082
satimage	DecisionTree	0.1355	0.0973	0.0098

Table 23: sqrt L2DistLoss with $\delta = 0.01, \epsilon = 0.01$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1897	0.0597	0.0045
coil_2000	DecisionTree	0.2742	0.0597	0.0029
$fact_balanced$	RandomForest	0.8018	0.5	0.077
$fact_imbalanced$	RandomForest	0.0402	0.01	0.0029
letter_img	LogisticRegression	0.0378	0.0367	0.0205
letter_img	DecisionTree	0.0317	0.0367	0.0174
optical_digits	LogisticRegression	0.0932	0.0986	0.0188
optical_digits	DecisionTree	0.1401	0.0986	0.0096
pen_digits	LogisticRegression	0.0937	0.096	0.0186
pen_digits	DecisionTree	0.054	0.096	0.0259
protein_homo	LogisticRegression	0.0119	0.0089	0.0132
protein_homo	DecisionTree	0.0152	0.0089	0.0083
satimage	LogisticRegression	0.2749	0.0973	0.0059
satimage	DecisionTree	0.2632	0.0973	0.0051

Table 24: sqrt L2DistLoss with $\delta = 0.05, \epsilon = 0.01$

	1) -	0.0-
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1868	0.0597	0.0045
coil_2000	DecisionTree	0.2712	0.0597	0.0029
$fact_balanced$	RandomForest	0.8012	0.5	0.0786
fact_imbalanced	RandomForest	0.0393	0.01	0.0029
letter_img	LogisticRegression	0.0358	0.0367	0.0214
letter_img	DecisionTree	0.0297	0.0367	0.018
optical_digits	LogisticRegression	0.0893	0.0986	0.0197
optical_digits	DecisionTree	0.1361	0.0986	0.0098
pen_digits	LogisticRegression	0.0909	0.096	0.0193
pen_digits	DecisionTree	0.0512	0.096	0.0271
protein_homo	LogisticRegression	0.0112	0.0089	0.0134
protein_homo	DecisionTree	0.0144	0.0089	0.0084
satimage	LogisticRegression	0.2712	0.0973	0.006
satimage	DecisionTree	0.2595	0.0973	0.0051

Table 25: sqrt L2DistLoss with $\delta = 0.1, \epsilon = 0.01$

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data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1852	0.0597	0.0046
coil_2000	DecisionTree	0.2697	0.0597	0.0029
$fact_balanced$	RandomForest	0.8009	0.5	0.0795
$fact_imbalanced$	RandomForest	0.0389	0.01	0.0029
letter_img	LogisticRegression	0.0347	0.0367	0.0218
letter_img	DecisionTree	0.0286	0.0367	0.0183
optical_digits	LogisticRegression	0.0873	0.0986	0.0201
optical_digits	DecisionTree	0.1341	0.0986	0.0099
pen_digits	LogisticRegression	0.0895	0.096	0.0196
pen_digits	DecisionTree	0.0498	0.096	0.0277
protein_homo	LogisticRegression	0.0108	0.0089	0.0135
protein_homo	DecisionTree	0.014	0.0089	0.0084
satimage	LogisticRegression	0.2693	0.0973	0.0061
satimage	DecisionTree	0.2576	0.0973	0.0052

Table 26: uniform ZeroOneLoss with $\delta=0.01, \epsilon=0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0763	0.0597	0.0455
coil_2000	DecisionTree	0.1238	0.0597	0.0539
$fact_balanced$	RandomForest	0.3363	0.5	0.2047
$fact_imbalanced$	RandomForest	0.0144	0.01	0.0465
letter_img	LogisticRegression	0.0281	0.0367	0.1155
letter_img	DecisionTree	0.0201	0.0367	0.2231
optical_digits	LogisticRegression	0.0577	0.0986	0.1523
optical_digits	DecisionTree	0.0685	0.0986	0.1416
pen_digits	LogisticRegression	0.0543	0.096	0.1427
pen_digits	DecisionTree	0.0302	0.096	0.2969
protein_homo	LogisticRegression	0.0074	0.0089	0.1196
protein_homo	DecisionTree	0.0096	0.0089	0.1472
satimage	LogisticRegression	0.1188	0.0973	0.0464
satimage	DecisionTree	0.1175	0.0973	0.0908

Table 27: uniform ZeroOneLoss with $\delta=0.05, \epsilon=0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0733	0.0597	0.0464
coil_2000	DecisionTree	0.1208	0.0597	0.0554
fact_balanced	RandomForest	0.3357	0.5	0.207
fact_imbalanced	RandomForest	0.0135	0.01	0.0472
letter_img	LogisticRegression	0.026	0.0367	0.1208
letter_img	DecisionTree	0.0181	0.0367	0.2439
optical_digits	LogisticRegression	0.0537	0.0986	0.1632
optical_digits	DecisionTree	0.0646	0.0986	0.151
pen_digits	LogisticRegression	0.0515	0.096	0.1494
pen_digits	DecisionTree	0.0274	0.096	0.328
protein_homo	LogisticRegression	0.0066	0.0089	0.1238
protein_homo	DecisionTree	0.0088	0.0089	0.1537
satimage	LogisticRegression	0.1151	0.0973	0.0473
satimage	DecisionTree	0.1139	0.0973	0.0952

Table 28: uniform ZeroOneLoss with $\delta=0.1, \epsilon=0.05$

			0, -	0.00
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0718	0.0597	0.0469
coil_2000	DecisionTree	0.1193	0.0597	0.0562
$fact_balanced$	RandomForest	0.3354	0.5	0.2082
fact_imbalanced	RandomForest	0.0131	0.01	0.0475
letter_img	LogisticRegression	0.025	0.0367	0.1237
letter_img	DecisionTree	0.017	0.0367	0.2562
optical_digits	LogisticRegression	0.0517	0.0986	0.1694
optical_digits	DecisionTree	0.0626	0.0986	0.1562
pen_digits	LogisticRegression	0.05	0.096	0.1531
pen_digits	DecisionTree	0.0259	0.096	0.3465
protein_homo	LogisticRegression	0.0062	0.0089	0.1261
protein_homo	DecisionTree	0.0084	0.0089	0.1572
satimage	LogisticRegression	0.1132	0.0973	0.0478
satimage	DecisionTree	0.112	0.0973	0.0977

Table 29: uniform HingeLoss with $\delta = 0.01, \epsilon = 0.05$

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data	classifier	$L_{\mathcal{S}}(h)$	ps	Δp^*
coil_2000	LogisticRegression	0.2262	0.0597	0.0278
coil_2000	DecisionTree	0.2414	0.0597	0.0291
$fact_balanced$	RandomForest	0.8012	0.5	2.3627
fact_imbalanced	RandomForest	0.0435	0.01	0.0247
letter_img	LogisticRegression	0.0633	0.0367	0.0628
letter_img	DecisionTree	0.0295	0.0367	0.1431
optical_digits	LogisticRegression	0.1183	0.0986	0.0874
optical_digits	DecisionTree	0.1168	0.0986	0.0858
pen_digits	LogisticRegression	0.1363	0.096	0.0732
pen_digits	DecisionTree	0.0459	0.096	0.1965
protein_homo	LogisticRegression	0.0161	0.0089	0.0665
protein_homo	DecisionTree	0.0152	0.0089	0.0825
satimage	LogisticRegression	0.3474	0.0973	0.0315
satimage	DecisionTree	0.2162	0.0973	0.0525

Table 30: uniform HingeLoss with $\delta = 0.05, \epsilon = 0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2232	0.0597	0.0282
coil_2000	DecisionTree	0.2384	0.0597	0.0296
fact_balanced	RandomForest	0.8006	0.5	2.7139
$fact_imbalanced$	RandomForest	0.0427	0.01	0.0249
letter_img	LogisticRegression	0.0612	0.0367	0.0645
letter_img	DecisionTree	0.0275	0.0367	0.1514
optical_digits	LogisticRegression	0.1144	0.0986	0.0918
optical_digits	DecisionTree	0.1129	0.0986	0.0898
pen_digits	LogisticRegression	0.1335	0.096	0.0754
pen_digits	DecisionTree	0.0431	0.096	0.2097
protein_homo	LogisticRegression	0.0153	0.0089	0.0678
protein_homo	DecisionTree	0.0144	0.0089	0.0845
satimage	LogisticRegression	0.3437	0.0973	0.032
satimage	DecisionTree	0.2125	0.0973	0.054

Table 31: uniform HingeLoss with $\delta=0.1, \epsilon=0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2217	0.0597	0.0284
coil_2000	DecisionTree	0.2369	0.0597	0.0298
$fact_balanced$	RandomForest	0.8003	0.5	2.9326
$fact_imbalanced$	RandomForest	0.0422	0.01	0.025
letter_img	LogisticRegression	0.0601	0.0367	0.0654
letter_img	DecisionTree	0.0264	0.0367	0.1561
optical_digits	LogisticRegression	0.1124	0.0986	0.0942
optical_digits	DecisionTree	0.1109	0.0986	0.0921
pen_digits	LogisticRegression	0.132	0.096	0.0765
pen_digits	DecisionTree	0.0417	0.096	0.2172
protein_homo	LogisticRegression	0.0149	0.0089	0.0684
protein_homo	DecisionTree	0.014	0.0089	0.0856
satimage	LogisticRegression	0.3418	0.0973	0.0323
satimage	DecisionTree	0.2106	0.0973	0.0547

Table 32: uniform L1DistLoss with $\delta = 0.01, \epsilon = 0.05$

			0.0-, -	0.00
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2262	0.0597	0.0278
coil_2000	DecisionTree	0.2414	0.0597	0.0291
fact_balanced	RandomForest	0.8012	0.5	2.3627
fact_imbalanced	RandomForest	0.0435	0.01	0.0247
letter_img	LogisticRegression	0.0633	0.0367	0.0628
letter_img	DecisionTree	0.0295	0.0367	0.1431
optical_digits	LogisticRegression	0.1183	0.0986	0.0874
optical_digits	DecisionTree	0.1168	0.0986	0.0858
pen_digits	LogisticRegression	0.1363	0.096	0.0732
pen_digits	DecisionTree	0.0459	0.096	0.1965
protein_homo	LogisticRegression	0.0161	0.0089	0.0665
protein_homo	DecisionTree	0.0152	0.0089	0.0825
satimage	LogisticRegression	0.3474	0.0973	0.0315
satimage	DecisionTree	0.2162	0.0973	0.0525

Table 33: uniform L1DistLoss with $\delta = 0.05, \epsilon = 0.05$

			/ -	
data	classifier	$L_{\mathcal{S}}(h)$	ps	Δp^*
coil_2000	LogisticRegression	0.2232	0.0597	0.0282
coil_2000	DecisionTree	0.2384	0.0597	0.0296
$fact_balanced$	RandomForest	0.8006	0.5	2.7139
$fact_imbalanced$	RandomForest	0.0427	0.01	0.0249
letter_img	LogisticRegression	0.0612	0.0367	0.0645
letter_img	DecisionTree	0.0275	0.0367	0.1514
optical_digits	LogisticRegression	0.1144	0.0986	0.0918
optical_digits	DecisionTree	0.1129	0.0986	0.0898
pen_digits	LogisticRegression	0.1335	0.096	0.0754
pen_digits	DecisionTree	0.0431	0.096	0.2097
protein_homo	LogisticRegression	0.0153	0.0089	0.0678
protein_homo	DecisionTree	0.0144	0.0089	0.0845
satimage	LogisticRegression	0.3437	0.0973	0.032
satimage	DecisionTree	0.2125	0.0973	0.054

Table 34: uniform L1DistLoss with $\delta = 0.1, \epsilon = 0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2217	0.0597	0.0284
coil_2000	DecisionTree	0.2369	0.0597	0.0298
fact_balanced	RandomForest	0.8003	0.5	2.9326
$fact_imbalanced$	RandomForest	0.0422	0.01	0.025
letter_img	LogisticRegression	0.0601	0.0367	0.0654
letter_img	DecisionTree	0.0264	0.0367	0.1561
optical_digits	LogisticRegression	0.1124	0.0986	0.0942
optical_digits	DecisionTree	0.1109	0.0986	0.0921
pen_digits	LogisticRegression	0.132	0.096	0.0765
pen_digits	DecisionTree	0.0417	0.096	0.2172
protein_homo	LogisticRegression	0.0149	0.0089	0.0684
protein_homo	DecisionTree	0.014	0.0089	0.0856
satimage	LogisticRegression	0.3418	0.0973	0.0323
satimage	DecisionTree	0.2106	0.0973	0.0547

Table 35: uniform L2DistLoss with $\delta = 0.01, \epsilon = 0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2346	0.0597	0.0152
coil_2000	DecisionTree	0.4576	0.0597	0.0152
fact_balanced	RandomForest	0.8006	0.5	0.3928
fact_imbalanced	RandomForest	0.0445	0.01	0.0128
letter_img	LogisticRegression	0.0639	0.0367	0.0465
letter_img	DecisionTree	0.0483	0.0367	0.0835
optical_digits	LogisticRegression	0.1359	0.0986	0.0649
optical_digits	DecisionTree	0.2133	0.0986	0.0496
pen_digits	LogisticRegression	0.1372	0.096	0.0563
pen_digits	DecisionTree	0.0773	0.096	0.118
protein_homo	LogisticRegression	0.0161	0.0089	0.0397
protein_homo	DecisionTree	0.0264	0.0089	0.0441
satimage	LogisticRegression	0.3575	0.0973	0.018
satimage	DecisionTree	0.4134	0.0973	0.0285

Table 36: uniform L2DistLoss with $\delta = 0.05, \epsilon = 0.05$

			,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2317	0.0597	0.0153
coil_2000	DecisionTree	0.4547	0.0597	0.0154
$fact_balanced$	RandomForest	0.8	0.5	0.4014
fact_imbalanced	RandomForest	0.0436	0.01	0.0129
letter_img	LogisticRegression	0.0618	0.0367	0.0473
letter_img	DecisionTree	0.0463	0.0367	0.0863
optical_digits	LogisticRegression	0.132	0.0986	0.0674
optical_digits	DecisionTree	0.2094	0.0986	0.051
pen_digits	LogisticRegression	0.1344	0.096	0.0575
pen_digits	DecisionTree	0.0745	0.096	0.1235
protein_homo	LogisticRegression	0.0154	0.0089	0.0401
protein_homo	DecisionTree	0.0256	0.0089	0.0447
satimage	LogisticRegression	0.3538	0.0973	0.0182
satimage	DecisionTree	0.4098	0.0973	0.0289

Table 37: uniform L2DistLoss with $\delta = 0.1, \epsilon = 0.05$

		,	
classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
LogisticRegression	0.2301	0.0597	0.0154
DecisionTree	0.4532	0.0597	0.0154
RandomForest	0.7996	0.5	0.4059
RandomForest	0.0432	0.01	0.0129
LogisticRegression	0.0607	0.0367	0.0477
DecisionTree	0.0452	0.0367	0.0879
LogisticRegression	0.1299	0.0986	0.0687
DecisionTree	0.2074	0.0986	0.0518
LogisticRegression	0.1329	0.096	0.0582
DecisionTree	0.0731	0.096	0.1267
LogisticRegression	0.015	0.0089	0.0404
DecisionTree	0.0252	0.0089	0.045
LogisticRegression	0.352	0.0973	0.0182
DecisionTree	0.4079	0.0973	0.0291
	LogisticRegression DecisionTree RandomForest RandomForest LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree	LogisticRegression 0.2301 DecisionTree 0.4532 RandomForest 0.7996 RandomForest 0.0432 LogisticRegression 0.0607 DecisionTree 0.0452 LogisticRegression 0.1299 DecisionTree 0.2074 LogisticRegression 0.1329 DecisionTree 0.0731 LogisticRegression 0.015 DecisionTree 0.0252 LogisticRegression 0.352	LogisticRegression 0.2301 0.0597 DecisionTree 0.4532 0.0597 RandomForest 0.7996 0.5 RandomForest 0.0432 0.01 LogisticRegression 0.0607 0.0367 DecisionTree 0.0452 0.0367 LogisticRegression 0.1299 0.0986 DecisionTree 0.2074 0.0986 LogisticRegression 0.1329 0.096 DecisionTree 0.0731 0.096 LogisticRegression 0.015 0.0089 DecisionTree 0.0252 0.0089 LogisticRegression 0.352 0.0973

Table 38: sqrt ZeroOneLoss with $\delta=0.01, \epsilon=0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0752	0.0597	0.0531
coil_2000	DecisionTree	0.0808	0.0597	0.0523
fact_balanced	RandomForest	0.3365	0.5	0.2015
fact_imbalanced	RandomForest	0.0144	0.01	0.0465
letter_img	LogisticRegression	0.0199	0.0367	0.2128
letter_img	DecisionTree	0.016	0.0367	0.23
optical_digits	LogisticRegression	0.0445	0.0986	0.1995
optical_digits	DecisionTree	0.0502	0.0986	0.1449
pen_digits	LogisticRegression	0.0408	0.096	0.2056
pen_digits	DecisionTree	0.0244	0.096	0.3123
protein_homo	LogisticRegression	0.0064	0.0089	0.1713
protein_homo	DecisionTree	0.0068	0.0089	0.1399
satimage	LogisticRegression	0.1241	0.0973	0.0574
satimage	DecisionTree	0.08	0.0973	0.0866

Table 39: sqrt ZeroOneLoss with $\delta=0.05, \epsilon=0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0722	0.0597	0.0543
coil_2000	DecisionTree	0.0778	0.0597	0.0535
$fact_balanced$	RandomForest	0.3359	0.5	0.2037
$fact_imbalanced$	RandomForest	0.0135	0.01	0.0471
letter_img	LogisticRegression	0.0179	0.0367	0.2314
letter_img	DecisionTree	0.0139	0.0367	0.252
optical_digits	LogisticRegression	0.0406	0.0986	0.2185
optical_digits	DecisionTree	0.0463	0.0986	0.1547
pen_digits	LogisticRegression	0.038	0.096	0.2199
pen_digits	DecisionTree	0.0216	0.096	0.3476
protein_homo	LogisticRegression	0.0056	0.0089	0.1801
protein_homo	DecisionTree	0.006	0.0089	0.1457
satimage	LogisticRegression	0.1205	0.0973	0.0588
satimage	DecisionTree	0.0763	0.0973	0.0898

Table 40: sqrt ZeroOneLoss with $\delta = 0.1, \epsilon = 0.05$

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data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000 coil_2000 fact_balanced fact_imbalanced letter_img letter_img optical_digits optical_digits pen_digits pen_digits protein_homo	classifier LogisticRegression DecisionTree RandomForest RandomForest LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression	$L_{\mathcal{S}}(h)$ 0.0707 0.0763 0.3356 0.0131 0.0168 0.0128 0.0385 0.0443 0.0365 0.0201 0.0052	0.0597 0.0597 0.597 0.5 0.01 0.0367 0.0986 0.0986 0.096 0.096 0.0089	Δp^* 0.055 0.0541 0.2049 0.0475 0.2423 0.2651 0.2297 0.1603 0.228 0.369 0.185
protein_homo satimage satimage	DecisionTree LogisticRegression DecisionTree	0.0056 0.1186 0.0744	0.0089 0.0973 0.0973	0.1489 0.0596 0.0915

Table 41: sqrt HingeLoss with $\delta = 0.01, \epsilon = 0.05$

	1 0		,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1776	0.0597	0.034
coil_2000	DecisionTree	0.1457	0.0597	0.0276
fact_balanced	RandomForest	0.8014	0.5	2.219
$fact_{imbalanced}$	RandomForest	0.0317	0.01	0.0261
letter_img	LogisticRegression	0.0381	0.0367	0.1067
letter_img	DecisionTree	0.0212	0.0367	0.1485
optical_digits	LogisticRegression	0.0824	0.0986	0.1136
optical_digits	DecisionTree	0.0801	0.0986	0.0866
pen_digits	LogisticRegression	0.0916	0.096	0.1059
pen_digits	DecisionTree	0.0342	0.096	0.2118
protein_homo	LogisticRegression	0.0117	0.0089	0.0973
protein_homo	DecisionTree	0.0096	0.0089	0.078
satimage	LogisticRegression	0.2584	0.0973	0.04
satimage	DecisionTree	0.141	0.0973	0.0477

Table 42: sqrt HingeLoss with $\delta = 0.05, \epsilon = 0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1746	0.0597	0.0346
coil_2000	DecisionTree	0.1427	0.0597	0.028
fact_balanced	RandomForest	0.8008	0.5	2.5283
fact_imbalanced	RandomForest	0.0308	0.01	0.0263
letter_img	LogisticRegression	0.036	0.0367	0.1112
letter_img	DecisionTree	0.0192	0.0367	0.1575
optical_digits	LogisticRegression	0.0785	0.0986	0.1195
optical_digits	DecisionTree	0.0762	0.0986	0.0901
pen_digits	LogisticRegression	0.0888	0.096	0.1105
pen_digits	DecisionTree	0.0314	0.096	0.2278
protein_homo	LogisticRegression	0.0109	0.0089	0.1001
protein_homo	DecisionTree	0.0088	0.0089	0.0797
satimage	LogisticRegression	0.2547	0.0973	0.0408
satimage	DecisionTree	0.1374	0.0973	0.0486

Table 43: sqrt HingeLoss with $\delta = 0.1, \epsilon = 0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1731	0.0597	0.0349
coil_2000	DecisionTree	0.1412	0.0597	0.0282
$fact_balanced$	RandomForest	0.8005	0.5	8.2915
fact_imbalanced	RandomForest	0.0304	0.01	0.0264
letter_img	LogisticRegression	0.035	0.0367	0.1136
letter_img	DecisionTree	0.0181	0.0367	0.1625
optical_digits	LogisticRegression	0.0765	0.0986	0.1228
optical_digits	DecisionTree	0.0742	0.0986	0.0919
pen_digits	LogisticRegression	0.0873	0.096	0.113
pen_digits	DecisionTree	0.03	0.096	0.2371
protein_homo	LogisticRegression	0.0106	0.0089	0.1016
protein_homo	DecisionTree	0.0084	0.0089	0.0807
satimage	LogisticRegression	0.2529	0.0973	0.0412
satimage	DecisionTree	0.1355	0.0973	0.0491

Table 44: sqrt L1DistLoss with $\delta = 0.01, \epsilon = 0.05$

	±		,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1776	0.0597	0.034
coil_2000	DecisionTree	0.1457	0.0597	0.0276
$fact_balanced$	RandomForest	0.8014	0.5	2.219
$fact_imbalanced$	RandomForest	0.0317	0.01	0.0261
letter_img	LogisticRegression	0.0381	0.0367	0.1067
letter_img	DecisionTree	0.0212	0.0367	0.1485
optical_digits	LogisticRegression	0.0824	0.0986	0.1136
optical_digits	DecisionTree	0.0801	0.0986	0.0866
pen_digits	LogisticRegression	0.0916	0.096	0.1059
pen_digits	DecisionTree	0.0342	0.096	0.2118
protein_homo	LogisticRegression	0.0117	0.0089	0.0973
protein_homo	DecisionTree	0.0096	0.0089	0.078
satimage	LogisticRegression	0.2584	0.0973	0.04
satimage	DecisionTree	0.141	0.0973	0.0477
_				

Table 45: sqrt L1DistLoss with $\delta = 0.05, \epsilon = 0.05$

	1		,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1746	0.0597	0.0346
coil_2000	DecisionTree	0.1427	0.0597	0.028
$fact_balanced$	RandomForest	0.8008	0.5	2.5283
$fact_imbalanced$	RandomForest	0.0308	0.01	0.0263
letter_img	LogisticRegression	0.036	0.0367	0.1112
letter_img	DecisionTree	0.0192	0.0367	0.1575
optical_digits	LogisticRegression	0.0785	0.0986	0.1195
optical_digits	DecisionTree	0.0762	0.0986	0.0901
pen_digits	LogisticRegression	0.0888	0.096	0.1105
pen_digits	DecisionTree	0.0314	0.096	0.2278
protein_homo	LogisticRegression	0.0109	0.0089	0.1001
protein_homo	DecisionTree	0.0088	0.0089	0.0797
satimage	LogisticRegression	0.2547	0.0973	0.0408
satimage	DecisionTree	0.1374	0.0973	0.0486

Table 46: sqrt L1DistLoss with $\delta = 0.1, \epsilon = 0.05$

	*			
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1731	0.0597	0.0349
coil_2000	DecisionTree	0.1412	0.0597	0.0282
$fact_balanced$	RandomForest	0.8005	0.5	12.3846
fact_imbalanced	RandomForest	0.0304	0.01	0.0264
letter_img	LogisticRegression	0.035	0.0367	0.1136
letter_img	DecisionTree	0.0181	0.0367	0.1625
optical_digits	LogisticRegression	0.0765	0.0986	0.1228
optical_digits	DecisionTree	0.0742	0.0986	0.0919
pen_digits	LogisticRegression	0.0873	0.096	0.113
pen_digits	DecisionTree	0.03	0.096	0.2371
protein_homo	LogisticRegression	0.0106	0.0089	0.1016
protein_homo	DecisionTree	0.0084	0.0089	0.0807
satimage	LogisticRegression	0.2529	0.0973	0.0412
satimage	DecisionTree	0.1355	0.0973	0.0491

Table 47: sqrt L2DistLoss with $\delta = 0.01, \epsilon = 0.05$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1897	0.0597	0.0224
coil_2000	DecisionTree	0.2742	0.0597	0.0144
$fact_balanced$	RandomForest	0.8018	0.5	0.385
$fact_imbalanced$	RandomForest	0.0402	0.01	0.0144
letter_img	LogisticRegression	0.0378	0.0367	0.1026
letter_img	DecisionTree	0.0317	0.0367	0.087
optical_digits	LogisticRegression	0.0932	0.0986	0.0942
optical_digits	DecisionTree	0.1401	0.0986	0.048
pen_digits	LogisticRegression	0.0937	0.096	0.0928
pen_digits	DecisionTree	0.054	0.096	0.1295
protein_homo	LogisticRegression	0.0119	0.0089	0.0658
protein_homo	DecisionTree	0.0152	0.0089	0.0413
satimage	LogisticRegression	0.2749	0.0973	0.0297
satimage	DecisionTree	0.2632	0.0973	0.0254

Table 48: sqrt L2DistLoss with $\delta = 0.05, \epsilon = 0.05$

Table 49: sqrt L2DistLoss with $\delta = 0.1, \epsilon = 0.05$

	1		,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1852	0.0597	0.0228
coil_2000	DecisionTree	0.2697	0.0597	0.0145
$fact_balanced$	RandomForest	0.8009	0.5	0.3975
$fact_imbalanced$	RandomForest	0.0389	0.01	0.0145
letter_img	LogisticRegression	0.0347	0.0367	0.1091
letter_img	DecisionTree	0.0286	0.0367	0.0917
optical_digits	LogisticRegression	0.0873	0.0986	0.1005
optical_digits	DecisionTree	0.1341	0.0986	0.0497
pen_digits	LogisticRegression	0.0895	0.096	0.0982
pen_digits	DecisionTree	0.0498	0.096	0.1387
protein_homo	LogisticRegression	0.0108	0.0089	0.0677
protein_homo	DecisionTree	0.014	0.0089	0.0421
satimage	LogisticRegression	0.2693	0.0973	0.0304
satimage	DecisionTree	0.2576	0.0973	0.0259

Table 50: uniform ZeroOneLoss with $\delta=0.01, \epsilon=0.1$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0763	0.0597	0.091
coil_2000	DecisionTree	0.1238	0.0597	0.1079
fact_balanced	RandomForest	0.3363	0.5	0.4093
fact_imbalanced	RandomForest	0.0144	0.01	0.093
letter_img	LogisticRegression	0.0281	0.0367	0.231
letter_img	DecisionTree	0.0201	0.0367	0.4463
optical_digits	LogisticRegression	0.0577	0.0986	0.3046
optical_digits	DecisionTree	0.0685	0.0986	0.2832
pen_digits	LogisticRegression	0.0543	0.096	0.2854
pen_digits	DecisionTree	0.0302	0.096	0.5939
protein_homo	LogisticRegression	0.0074	0.0089	0.2393
protein_homo	DecisionTree	0.0096	0.0089	0.2945
satimage	LogisticRegression	0.1188	0.0973	0.0928
satimage	DecisionTree	0.1175	0.0973	0.1816

Table 51: uniform ZeroOneLoss with $\delta = 0.05, \epsilon = 0.1$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0733	0.0597	0.0928
coil_2000	DecisionTree	0.1208	0.0597	0.1109
$fact_balanced$	RandomForest	0.3357	0.5	0.414
$fact_imbalanced$	RandomForest	0.0135	0.01	0.0943
letter_img	LogisticRegression	0.026	0.0367	0.2416
letter_img	DecisionTree	0.0181	0.0367	0.4879
optical_digits	LogisticRegression	0.0537	0.0986	0.3263
optical_digits	DecisionTree	0.0646	0.0986	0.3021
pen_digits	LogisticRegression	0.0515	0.096	0.2988
pen_digits	DecisionTree	0.0274	0.096	0.6559
protein_homo	LogisticRegression	0.0066	0.0089	0.2477
protein_homo	DecisionTree	0.0088	0.0089	0.3073
satimage	LogisticRegression	0.1151	0.0973	0.0946
satimage	DecisionTree	0.1139	0.0973	0.1905

Table 52: uniform ZeroOneLoss with $\delta=0.1, \epsilon=0.1$

			- , -	0
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0718	0.0597	0.0937
coil_2000	DecisionTree	0.1193	0.0597	0.1125
$fact_balanced$	RandomForest	0.3354	0.5	0.4164
fact_imbalanced	RandomForest	0.0131	0.01	0.095
letter_img	LogisticRegression	0.025	0.0367	0.2474
letter_img	DecisionTree	0.017	0.0367	0.5124
optical_digits	LogisticRegression	0.0517	0.0986	0.3387
optical_digits	DecisionTree	0.0626	0.0986	0.3124
pen_digits	LogisticRegression	0.05	0.096	0.3062
pen_digits	DecisionTree	0.0259	0.096	0.6931
protein_homo	LogisticRegression	0.0062	0.0089	0.2522
protein_homo	DecisionTree	0.0084	0.0089	0.3144
satimage	LogisticRegression	0.1132	0.0973	0.0955
satimage	DecisionTree	0.112	0.0973	0.1954

Table 53: uniform HingeLoss with $\delta = 0.01, \epsilon = 0.1$

	0		, -	-
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2262	0.0597	0.0555
coil_2000	DecisionTree	0.2414	0.0597	0.0583
$fact_balanced$	RandomForest	0.8012	0.5	4.7254
$fact_{imbalanced}$	RandomForest	0.0435	0.01	0.0495
letter_img	LogisticRegression	0.0633	0.0367	0.1255
letter_img	DecisionTree	0.0295	0.0367	0.2862
optical_digits	LogisticRegression	0.1183	0.0986	0.1748
optical_digits	DecisionTree	0.1168	0.0986	0.1715
pen_digits	LogisticRegression	0.1363	0.096	0.1464
pen_digits	DecisionTree	0.0459	0.096	0.3929
protein_homo	LogisticRegression	0.0161	0.0089	0.133
protein_homo	DecisionTree	0.0152	0.0089	0.165
satimage	LogisticRegression	0.3474	0.0973	0.063
satimage	DecisionTree	0.2162	0.0973	0.105

Table 54: uniform HingeLoss with $\delta = 0.05, \epsilon = 0.1$

data	classifier	$L_{\mathcal{S}}(h)$	ps	Δp^*
coil_2000	LogisticRegression	0.2232	0.0597	0.0563
coil_2000	DecisionTree	0.2384	0.0597	0.0591
fact_balanced	RandomForest	0.8006	0.5	5.4278
$fact_imbalanced$	RandomForest	0.0427	0.01	0.0499
letter_img	LogisticRegression	0.0612	0.0367	0.129
letter_img	DecisionTree	0.0275	0.0367	0.3029
optical_digits	LogisticRegression	0.1144	0.0986	0.1836
optical_digits	DecisionTree	0.1129	0.0986	0.1796
pen_digits	LogisticRegression	0.1335	0.096	0.1507
pen_digits	DecisionTree	0.0431	0.096	0.4194
protein_homo	LogisticRegression	0.0153	0.0089	0.1355
protein_homo	DecisionTree	0.0144	0.0089	0.169
satimage	LogisticRegression	0.3437	0.0973	0.064
satimage	DecisionTree	0.2125	0.0973	0.1079
barimago	200.010111100	0.2120	0.00.0	- 0.

Table 55: uniform HingeLoss with $\delta = 0.1, \epsilon = 0.1$

classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
LogisticRegression	0.2217	0.0597	0.0567
DecisionTree	0.2369	0.0597	0.0596
RandomForest	0.8003	0.5	5.8653
RandomForest	0.0422	0.01	0.0501
LogisticRegression	0.0601	0.0367	0.1309
DecisionTree	0.0264	0.0367	0.3123
LogisticRegression	0.1124	0.0986	0.1884
DecisionTree	0.1109	0.0986	0.1843
LogisticRegression	0.132	0.096	0.153
DecisionTree	0.0417	0.096	0.4344
LogisticRegression	0.0149	0.0089	0.1369
DecisionTree	0.014	0.0089	0.1711
LogisticRegression	0.3418	0.0973	0.0645
DecisionTree	0.2106	0.0973	0.1095
	LogisticRegression DecisionTree RandomForest RandomForest LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree	LogisticRegression	LogisticRegression 0.2217 0.0597 DecisionTree 0.2369 0.0597 RandomForest 0.8003 0.5 RandomForest 0.0422 0.01 LogisticRegression 0.0601 0.0367 DecisionTree 0.0264 0.0367 LogisticRegression 0.1124 0.0986 DecisionTree 0.1109 0.0986 LogisticRegression 0.132 0.096 DecisionTree 0.0417 0.096 LogisticRegression 0.0149 0.0089 DecisionTree 0.014 0.0089 LogisticRegression 0.3418 0.0973

Table 56: uniform L1DistLoss with $\delta = 0.01, \epsilon = 0.1$

			0.0-, 0	0
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2262	0.0597	0.0555
coil_2000	DecisionTree	0.2414	0.0597	0.0583
fact_balanced	RandomForest	0.8012	0.5	4.7254
$fact_imbalanced$	RandomForest	0.0435	0.01	0.0495
letter_img	LogisticRegression	0.0633	0.0367	0.1255
letter_img	DecisionTree	0.0295	0.0367	0.2862
optical_digits	LogisticRegression	0.1183	0.0986	0.1748
optical_digits	DecisionTree	0.1168	0.0986	0.1715
pen_digits	LogisticRegression	0.1363	0.096	0.1464
pen_digits	DecisionTree	0.0459	0.096	0.3929
protein_homo	LogisticRegression	0.0161	0.0089	0.133
protein_homo	DecisionTree	0.0152	0.0089	0.165
satimage	LogisticRegression	0.3474	0.0973	0.063
satimage	DecisionTree	0.2162	0.0973	0.105

Table 57: uniform L1DistLoss with $\delta = 0.05, \epsilon = 0.1$

10010 011 0111	101111 212 1002	***************************************	0.00,0	0.1
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2232	0.0597	0.0563
coil_2000	DecisionTree	0.2384	0.0597	0.0591
$fact_balanced$	RandomForest	0.8006	0.5	5.4278
fact_imbalanced	RandomForest	0.0427	0.01	0.0499
letter_img	LogisticRegression	0.0612	0.0367	0.129
letter_img	DecisionTree	0.0275	0.0367	0.3029
optical_digits	LogisticRegression	0.1144	0.0986	0.1836
optical_digits	DecisionTree	0.1129	0.0986	0.1796
pen_digits	LogisticRegression	0.1335	0.096	0.1507
pen_digits	DecisionTree	0.0431	0.096	0.4194
protein_homo	LogisticRegression	0.0153	0.0089	0.1355
protein_homo	DecisionTree	0.0144	0.0089	0.169
satimage	LogisticRegression	0.3437	0.0973	0.064
satimage	DecisionTree	0.2125	0.0973	0.1079

Table 58: uniform L1DistLoss with $\delta = 0.1, \epsilon = 0.1$

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data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2217	0.0597	0.0567
coil_2000	DecisionTree	0.2369	0.0597	0.0596
fact_balanced	RandomForest	0.8003	0.5	5.8653
$fact_imbalanced$	RandomForest	0.0422	0.01	0.0501
letter_img	LogisticRegression	0.0601	0.0367	0.1309
letter_img	DecisionTree	0.0264	0.0367	0.3123
optical_digits	LogisticRegression	0.1124	0.0986	0.1884
optical_digits	DecisionTree	0.1109	0.0986	0.1843
pen_digits	LogisticRegression	0.132	0.096	0.153
pen_digits	DecisionTree	0.0417	0.096	0.4344
protein_homo	LogisticRegression	0.0149	0.0089	0.1369
protein_homo	DecisionTree	0.014	0.0089	0.1711
satimage	LogisticRegression	0.3418	0.0973	0.0645
satimage	DecisionTree	0.2106	0.0973	0.1095

Table 59: uniform L2DistLoss with $\delta = 0.01, \epsilon = 0.1$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2346	0.0597	0.0304
coil_2000	DecisionTree	0.4576	0.0597	0.0305
fact_balanced	RandomForest	0.8006	0.5	0.7857
fact_imbalanced	RandomForest	0.0445	0.01	0.0256
letter_img	LogisticRegression	0.0639	0.0367	0.093
letter_img	DecisionTree	0.0483	0.0367	0.167
optical_digits	LogisticRegression	0.1359	0.0986	0.1299
optical_digits	DecisionTree	0.2133	0.0986	0.0992
pen_digits	LogisticRegression	0.1372	0.096	0.1125
pen_digits	DecisionTree	0.0773	0.096	0.236
protein_homo	LogisticRegression	0.0161	0.0089	0.0794
protein_homo	DecisionTree	0.0264	0.0089	0.0881
satimage	LogisticRegression	0.3575	0.0973	0.036
satimage	DecisionTree	0.4134	0.0973	0.057

Table 60: uniform L2DistLoss with $\delta = 0.05, \epsilon = 0.1$

			, -	-
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2317	0.0597	0.0307
coil_2000	DecisionTree	0.4547	0.0597	0.0307
$fact_balanced$	RandomForest	0.8	0.5	0.8029
$fact_imbalanced$	RandomForest	0.0436	0.01	0.0257
letter_img	LogisticRegression	0.0618	0.0367	0.0946
letter_img	DecisionTree	0.0463	0.0367	0.1726
optical_digits	LogisticRegression	0.132	0.0986	0.1347
optical_digits	DecisionTree	0.2094	0.0986	0.102
pen_digits	LogisticRegression	0.1344	0.096	0.1151
pen_digits	DecisionTree	0.0745	0.096	0.247
protein_homo	LogisticRegression	0.0154	0.0089	0.0803
protein_homo	DecisionTree	0.0256	0.0089	0.0893
satimage	LogisticRegression	0.3538	0.0973	0.0363
satimage	DecisionTree	0.4098	0.0973	0.0578

Table 61: uniform L2DistLoss with $\delta = 0.1, \epsilon = 0.1$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.2301	0.0597	0.0308
coil_2000	DecisionTree	0.4532	0.0597	0.0308
$fact_balanced$	RandomForest	0.7996	0.5	0.8119
$fact_imbalanced$	RandomForest	0.0432	0.01	0.0258
letter_img	LogisticRegression	0.0607	0.0367	0.0955
letter_img	DecisionTree	0.0452	0.0367	0.1757
optical_digits	LogisticRegression	0.1299	0.0986	0.1373
optical_digits	DecisionTree	0.2074	0.0986	0.1035
pen_digits	LogisticRegression	0.1329	0.096	0.1164
pen_digits	DecisionTree	0.0731	0.096	0.2533
protein_homo	LogisticRegression	0.015	0.0089	0.0807
protein_homo	DecisionTree	0.0252	0.0089	0.0899
satimage	LogisticRegression	0.352	0.0973	0.0365
satimage	DecisionTree	0.4079	0.0973	0.0583

Table 62: sqrt ZeroOneLoss with $\delta = 0.01, \epsilon = 0.1$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0752	0.0597	0.1062
coil_2000	DecisionTree	0.0808	0.0597	0.1045
fact_balanced	RandomForest	0.3365	0.5	0.403
fact_imbalanced	RandomForest	0.0144	0.01	0.093
letter_img	LogisticRegression	0.0199	0.0367	0.4256
letter_img	DecisionTree	0.016	0.0367	0.46
optical_digits	LogisticRegression	0.0445	0.0986	0.399
optical_digits	DecisionTree	0.0502	0.0986	0.2897
pen_digits	LogisticRegression	0.0408	0.096	0.4112
pen_digits	DecisionTree	0.0244	0.096	0.6247
protein_homo	LogisticRegression	0.0064	0.0089	0.3427
protein_homo	DecisionTree	0.0068	0.0089	0.2799
satimage	LogisticRegression	0.1241	0.0973	0.1147
satimage	DecisionTree	0.08	0.0973	0.1732

Table 63: sqrt ZeroOneLoss with $\delta = 0.05, \epsilon = 0.1$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0722	0.0597	0.1087
coil_2000	DecisionTree	0.0778	0.0597	0.1069
$fact_balanced$	RandomForest	0.3359	0.5	0.4075
fact_imbalanced	RandomForest	0.0135	0.01	0.0943
letter_img	LogisticRegression	0.0179	0.0367	0.4629
letter_img	DecisionTree	0.0139	0.0367	0.5041
optical_digits	LogisticRegression	0.0406	0.0986	0.437
optical_digits	DecisionTree	0.0463	0.0986	0.3094
pen_digits	LogisticRegression	0.038	0.096	0.4398
pen_digits	DecisionTree	0.0216	0.096	0.6951
protein_homo	LogisticRegression	0.0056	0.0089	0.3602
protein_homo	DecisionTree	0.006	0.0089	0.2915
satimage	LogisticRegression	0.1205	0.0973	0.1176
satimage	DecisionTree	0.0763	0.0973	0.1796

Table 64: sqrt ZeroOneLoss with $\delta = 0.1, \epsilon = 0.1$

	1		0, -	0
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.0707	0.0597	0.1099
coil_2000	DecisionTree	0.0763	0.0597	0.1082
$fact_balanced$	RandomForest	0.3356	0.5	0.4098
$fact_imbalanced$	RandomForest	0.0131	0.01	0.095
letter_img	LogisticRegression	0.0168	0.0367	0.4847
letter_img	DecisionTree	0.0128	0.0367	0.5302
optical_digits	LogisticRegression	0.0385	0.0986	0.4595
optical_digits	DecisionTree	0.0443	0.0986	0.3205
pen_digits	LogisticRegression	0.0365	0.096	0.4561
pen_digits	DecisionTree	0.0201	0.096	0.738
protein_homo	LogisticRegression	0.0052	0.0089	0.3699
protein_homo	DecisionTree	0.0056	0.0089	0.2978
satimage	LogisticRegression	0.1186	0.0973	0.1192
satimage	DecisionTree	0.0744	0.0973	0.183

Table 65: sqrt HingeLoss with $\delta = 0.01, \epsilon = 0.1$

	9410 11111802000 111	011 0	,,,,,	0.1
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1776	0.0597	0.0681
coil_2000	DecisionTree	0.1457	0.0597	0.0553
$fact_balanced$	RandomForest	0.8014	0.5	4.4379
$fact_imbalanced$	RandomForest	0.0317	0.01	0.0522
letter_img	LogisticRegression	0.0381	0.0367	0.2134
letter_img	DecisionTree	0.0212	0.0367	0.2971
optical_digits	LogisticRegression	0.0824	0.0986	0.2273
optical_digits	DecisionTree	0.0801	0.0986	0.1733
pen_digits	LogisticRegression	0.0916	0.096	0.2118
pen_digits	DecisionTree	0.0342	0.096	0.4237
protein_homo	LogisticRegression	0.0117	0.0089	0.1947
protein_homo	DecisionTree	0.0096	0.0089	0.1559
satimage	LogisticRegression	0.2584	0.0973	0.0799
satimage	DecisionTree	0.141	0.0973	0.0953

Table 66: sqrt Hinge Loss with $\delta=0.05, \epsilon=0.1$

			,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1746	0.0597	0.0693
coil_2000	DecisionTree	0.1427	0.0597	0.0559
$fact_balanced$	RandomForest	0.8008	0.5	5.0567
$fact_imbalanced$	RandomForest	0.0308	0.01	0.0526
letter_img	LogisticRegression	0.036	0.0367	0.2224
letter_img	DecisionTree	0.0192	0.0367	0.315
optical_digits	LogisticRegression	0.0785	0.0986	0.239
optical_digits	DecisionTree	0.0762	0.0986	0.1801
pen_digits	LogisticRegression	0.0888	0.096	0.221
pen_digits	DecisionTree	0.0314	0.096	0.4557
protein_homo	LogisticRegression	0.0109	0.0089	0.2002
protein_homo	DecisionTree	0.0088	0.0089	0.1595
satimage	LogisticRegression	0.2547	0.0973	0.0816
satimage	DecisionTree	0.1374	0.0973	0.0972

Table 67: sqrt HingeLoss with $\delta = 0.1, \epsilon = 0.1$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1731	0.0597	0.0699
coil_2000	DecisionTree	0.1412	0.0597	0.0563
fact_balanced	RandomForest	0.8005	0.5	16.583
fact_imbalanced	RandomForest	0.0304	0.01	0.0528
letter_img	LogisticRegression	0.035	0.0367	0.2273
letter_img	DecisionTree	0.0181	0.0367	0.325
optical_digits	LogisticRegression	0.0765	0.0986	0.2457
optical_digits	DecisionTree	0.0742	0.0986	0.1839
pen_digits	LogisticRegression	0.0873	0.096	0.226
pen_digits	DecisionTree	0.03	0.096	0.4742
protein_homo	LogisticRegression	0.0106	0.0089	0.2031
protein_homo	DecisionTree	0.0084	0.0089	0.1613
satimage	LogisticRegression	0.2529	0.0973	0.0825
satimage	DecisionTree	0.1355	0.0973	0.0981

Table 68: sqrt L1DistLoss with $\delta = 0.01, \epsilon = 0.1$

	1		,	
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000 coil_2000 fact_balanced fact_imbalanced letter_img letter_img optical_digits optical_digits optical_digits pen_digits protein_homo	LogisticRegression DecisionTree RandomForest RandomForest LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree LogisticRegression DecisionTree	0.1776 0.1457 0.8014 0.0317 0.0381 0.0212 0.0824 0.0801 0.0916 0.0342 0.0117	0.0597 0.0597 0.5 0.01 0.0367 0.0367 0.0986 0.0986 0.096 0.096	0.0681 0.0553 4.4379 0.0522 0.2134 0.2971 0.2273 0.1733 0.2118 0.4237 0.1947
protein_homo protein_homo satimage satimage	LogisticRegression DecisionTree LogisticRegression DecisionTree	0.0117 0.0096 0.2584 0.141	0.0089 0.0089 0.0973 0.0973	0.1947 0.1559 0.0799 0.0953

Table 69: sqrt L1DistLoss with $\delta = 0.05, \epsilon = 0.1$

	1		,	-
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1746	0.0597	0.0693
coil_2000	DecisionTree	0.1427	0.0597	0.0559
$fact_balanced$	RandomForest	0.8008	0.5	5.0567
$fact_imbalanced$	RandomForest	0.0308	0.01	0.0526
letter_img	LogisticRegression	0.036	0.0367	0.2224
letter_img	DecisionTree	0.0192	0.0367	0.315
optical_digits	LogisticRegression	0.0785	0.0986	0.239
optical_digits	DecisionTree	0.0762	0.0986	0.1801
pen_digits	LogisticRegression	0.0888	0.096	0.221
pen_digits	DecisionTree	0.0314	0.096	0.4557
protein_homo	LogisticRegression	0.0109	0.0089	0.2002
protein_homo	DecisionTree	0.0088	0.0089	0.1595
satimage	LogisticRegression	0.2547	0.0973	0.0816
satimage	DecisionTree	0.1374	0.0973	0.0972

Table 70: sqrt L1DistLoss with $\delta = 0.1, \epsilon = 0.1$

	*			
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1731	0.0597	0.0699
coil_2000	DecisionTree	0.1412	0.0597	0.0563
fact_balanced	RandomForest	0.8005	0.5	24.7693
fact_imbalanced	RandomForest	0.0304	0.01	0.0528
letter_img	LogisticRegression	0.035	0.0367	0.2273
letter_img	DecisionTree	0.0181	0.0367	0.325
optical_digits	LogisticRegression	0.0765	0.0986	0.2457
optical_digits	DecisionTree	0.0742	0.0986	0.1839
pen_digits	LogisticRegression	0.0873	0.096	0.226
pen_digits	DecisionTree	0.03	0.096	0.4742
protein_homo	LogisticRegression	0.0106	0.0089	0.2031
protein_homo	DecisionTree	0.0084	0.0089	0.1613
satimage	LogisticRegression	0.2529	0.0973	0.0825
satimage	DecisionTree	0.1355	0.0973	0.0981

Table 71: sqrt L2DistLoss with $\delta=0.01, \epsilon=0.1$

data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1897	0.0597	0.0447
coil_2000	DecisionTree	0.2742	0.0597	0.0288
$fact_balanced$	RandomForest	0.8018	0.5	0.7699
fact_imbalanced	RandomForest	0.0402	0.01	0.0287
letter_img	LogisticRegression	0.0378	0.0367	0.2053
letter_img	DecisionTree	0.0317	0.0367	0.1741
optical_digits	LogisticRegression	0.0932	0.0986	0.1885
optical_digits	DecisionTree	0.1401	0.0986	0.0961
pen_digits	LogisticRegression	0.0937	0.096	0.1856
pen_digits	DecisionTree	0.054	0.096	0.259
protein_homo	LogisticRegression	0.0119	0.0089	0.1316
protein_homo	DecisionTree	0.0152	0.0089	0.0827
satimage	LogisticRegression	0.2749	0.0973	0.0595
satimage	DecisionTree	0.2632	0.0973	0.0508

Table 72: sqrt L2DistLoss with $\delta = 0.05, \epsilon = 0.1$

	1		0.00,0	0
data	classifier	$L_{\mathcal{S}}(h)$	$p_{\mathcal{S}}$	Δp^*
coil_2000	LogisticRegression	0.1868	0.0597	0.0452
coil_2000	DecisionTree	0.2712	0.0597	0.029
$fact_balanced$	RandomForest	0.8012	0.5	0.7865
fact_imbalanced	RandomForest	0.0393	0.01	0.0289
letter_img	LogisticRegression	0.0358	0.0367	0.2136
letter_img	DecisionTree	0.0297	0.0367	0.1801
optical_digits	LogisticRegression	0.0893	0.0986	0.1966
optical_digits	DecisionTree	0.1361	0.0986	0.0982
pen_digits	LogisticRegression	0.0909	0.096	0.1926
pen_digits	DecisionTree	0.0512	0.096	0.2709
protein_homo	LogisticRegression	0.0112	0.0089	0.1341
protein_homo	DecisionTree	0.0144	0.0089	0.0837
satimage	LogisticRegression	0.2712	0.0973	0.0604
satimage	DecisionTree	0.2595	0.0973	0.0515

Table 73: sqrt L2DistLoss with $\delta = 0.1, \epsilon = 0.1$

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data	classifier	$L_{\mathcal{S}}(h)$	ps	Δp^*
coil_2000	LogisticRegression	0.1852	0.0597	0.0455
coil_2000	DecisionTree	0.2697	0.0597	0.0291
$fact_balanced$	RandomForest	0.8009	0.5	0.7951
$fact_imbalanced$	RandomForest	0.0389	0.01	0.0289
letter_img	LogisticRegression	0.0347	0.0367	0.2182
letter_img	DecisionTree	0.0286	0.0367	0.1834
optical_digits	LogisticRegression	0.0873	0.0986	0.2009
optical_digits	DecisionTree	0.1341	0.0986	0.0993
pen_digits	LogisticRegression	0.0895	0.096	0.1964
pen_digits	DecisionTree	0.0498	0.096	0.2774
protein_homo	LogisticRegression	0.0108	0.0089	0.1354
protein_homo	DecisionTree	0.014	0.0089	0.0842
satimage	LogisticRegression	0.2693	0.0973	0.0609
satimage	DecisionTree	0.2576	0.0973	0.0518