Supplementary Material for Automated CASH optimization for class imbalance problems

Duc Anh Nguyen*, Jiawen Kong*, Hao Wang*, Stefan Menzel[§], Bernhard Sendhoff[§], Anna V. Kononova*, and Thomas Bäck*

*Leiden Institute of Advanced Computer Science (LIACS), Leiden University, The Netherlands

Email: {stefan.menzel,bernhard.sendhoff}@honda-ri.de

I. EXPERIMENTAL SETUP: PARAMETER SETTING

In this section, we present detailed information of the hyperparameters used in the classification algorithms¹ and resampling algorithms² that we used in our experiment. The entire Python code project can be found at https://github.com/ECOLE-ITN/CASH4IMBALANCE.

 $\begin{tabular}{ll} TABLE~S-1\\ Hyperparameters~of~Classification~Algorithms \end{tabular}$

Alg.	Params.	Range
- m	max_iter	10000
Support Vector Machines	cache_size	700 (Megabyte)
ig	probability	[True, False]
Ţa.	C	$[0.5^5,100]$
-	kernel	[linear, rbf, poly, sigmoid]
Ę.	gamma	[auto, value, scale]
Ne le	gamma_value	[3.1e-05,8]
E	coef0	[-1.0, 1.0]
ōd	degree	[2, 5]
ď	shrinking	[True, False]
S.	tol	[1e-05, 1e-01]
	n_estimators	[1, 150]
est	criterion	[gini, entropy]
ō	max_features	[1, sqrt, log2, None]
	min_samples_split	[2, 20]
Į Į	min_samples_leaf	[1, 20]
Random Forest	class_weight	[balanced, balanced_subsample, None]
22	bootstrap	[True, False]
	n_neighbors	[1, 51]
	weights	[uniform, distance]
- ×	algorithm	[auto, ball_tree, kd_tree, brute]
K-Nearest Neighbors	p	[0, 20]
E E	metric	$\cdot p = 0 \rightarrow metric = chebyshev$
ei.		 p = 1 → metric = manhattan
<u> </u>		 p = 2 → metric = euclidean
		 p > 2 → metric = minkowski
	criterion	[gini, entropy]
Decision Tree	max_depth	[2,20]
s ë	max_features	[1, sqrt, log2, None]
Decis Tree	min_samples_split	[2, 20]
	min_samples_leaf	[1, 20]
	С	[1, 150]
. <u>.</u>	criterion	$[0.5^5, 100]$
ssa	tol	[1e-05, 1e-01]
<u>,</u>	11_ratio	[1e-09, 1]
₽ Be	(penalty, solver)	[(11, liblinear), (11, saga), (12, lbfgs),
. <u>:</u>	•	(12, newton-cg), (12, liblinear),
ji ji		(12, sag), (12, saga), (elasticnet, saga),
Logistic Regression		(none, newton-cg), (none, lbfgs),
_		(none, sag), (none, saga)]

¹All classification algorithms are implemented in the Python package **scikit-learn**(version 0.23.2) [1].

TABLE S-2 Hyperparameters of Resampling techniques (part i)

Group.	Params.	Range
Group.	CondensedNearest!	
	sampling_strategy	default
	n neighbors	[1, 50]
	n seeds S	[1, 50]
	EditedNearestNeigh	
	sampling_strategy	default
	n neighbors	[1, 20]
	kind sel	[all, mode]
	RepeatedEditedNea	
	sampling_strategy	default
	n neighbors	[1, 20]
ρū	kind sel	[all, mode]
Ē	AllKNN	[an, mode]
Under resampling	sampling_strategy	default
Şa	n_neighbors	[1, 20]
2	kind sel	[all, mode]
<u>e</u>	allow_minority	[True, False]
nC n	InstanceHardnessT	
_	sampling_strategy	default
	estimator	none, decision-tree, adaboost
	Commutor	knn, linear-sym, gradient-boosting
	cv	[2, 10]
	OneSidedSelection	[2, 10]
	sampling_strategy	default
	n_neighbors	[1, 20]
	n seeds S	[1, 20]
	RandomUnderSam	
	sampling_strategy	default
	replacement	[True, False]
	TomekLinks	[,]
	sampling_strategy	default
	NearMiss	
	sampling_strategy	default
	version	[1,3]
	n_neighbors	[1, 20]
	n_neighbors_ver3	[1, 20]
	NeighbourhoodClea	
	sampling_strategy	default
	n_neighbors	[1, 20]
	threshold_cleaning	[0.0, 1.0]
	ClusterCentroids	•
	sampling_strategy	default
	estimator	[KMeans, MiniBatchKMeans]
	voting	[hard, soft]
5.0		
Combine resampling	SMOTENN compling strategy	default
E E	sampling_strategy SMOTETomek	default
io Ses	sampling_strategy	default
<u>ا</u>	samping_snategy	исјини

In addition to the hyperparameters listed in Table S-1, Table S-2, and Table S-3, we use 10 random seeds i.e., 9, 18, 27, 29, 36, 39, 59, 79, 90, 109 for any algorithm which requires a random seed parameter.

²All resampling algorithms are implemented in the Python package **imbalanced-learn**(version 0.7.0) [2]

TABLE S-3
HYPERPARAMETERS OF RESAMPLING TECHNIQUES (PART II)

Group.	Params.	Range
	SMOTE	
	k_neighbors	[1, 10]
	sampling_strategy	default
	BorderlineSMOTE	
	sampling_strategy	default
	k_neighbors	[1, 10]
	m_neighbors	[1, 10]
	kind	[borderline1, borderline2]
	SMOTENC	
	sampling_strategy	default
50	categorical_features	True
.Ĕ	k_neighbors	[1, 10]
Over resampling	SVMSMOTE	
Ę	sampling_strategy	default
2	k_neighbors	[1, 10]
er	m_neighbors	[1, 10]
Õ	out_step	[0.0, 1.0]
•	KMeansSMOTE	
	sampling_strategy	default
	k_neighbors	[1, 10]
	cluster_balance_threshold	[1e-2, 1]
	ADASYN	
	sampling_strategy	default
	n_neighbors	[1, 10]
	RandomOverSampler	
	sampling_strategy	default

II. DATASETS

In this section, we present 44 examined datasets taken from the KEEL repository [3] in Table 4. For each dataset, we include the *Imbalance Ratio* (IR), which is the ratio of the number of majority class instances to that of minority class instances.

III. EXPERIMENTAL RESULTS - ADDITIONAL PLOTS

The distribution of GM over 10 repetitions for 44 datasets is visualized in Fig. S- 1. Each box plot represents 10 repetitions, the horizontal-inner line shows the median, the ends of the whisker show the lowest and the highest observed values (here, the whisker's scale is taken as 1.5). The ends of the color-box show the first and the third quartiles respectively, the dots in color represent outliers, and black-dots shows the observed values.

IV. ADDITIONAL PLOTS ON THE DATASET "ABALONE9-18"

This section provides 10 figures of 10 repeated executions using TPE and Random search on datataset "abalone9-18". The figure of each execution shown below is similar to Fig.2 in the main paper, at which each contains two plots. The above one is for TPE and the below is for Random. Full results of 44 datasets can be found in https://github.com/ECOLE-ITN/CASH4IMBALANCE.

TABLE S-4
THE NUMBER OF POSITIVE, NEGATIVE CLASSES, ATTRIBUTES (#ATT) AND THE IMBALANCE RATIO (IR) OF THE KEEL DATASETS, ORDERED BY INCREASING IR VALUE.

Data Sets	# Negative	# Positive	#Att	IR
glass1	138	76	9	1.82
ecoli-0_vs_1	77	143	7	1.86
wisconsin	444	239	9	1.86
pima	500	268	8	1.87
iris0	100	50	4	2
glass0	144	70	9	2.06
yeast1	1055	429	8	2.46
haberman	225	81	3	2.78
vehicle2	628	218	18	2.88
vehicle1	629	217	18	2.9
vehicle3	634	212	18	2.99
glass-0-1-2-3_vs_4-5-6	163	51	9	3.2
vehicle0	647	199	18	3.25
ecoli1	259	77	7	3.36
new-thyroid1	180	35	5	5.14
new-thyroid2	180	35	5	5.14
ecoli2	284	52	7	5.46
segment0	1979	329	19	6.02
glass6	185	29	9	6.38
yeast3	1321	163	8	8.1
ecoli3	301	35	7	8.6
page-blocks0	4913	559	10	8.79
yeast-2_vs_4	463	51	8	9.08
yeast-0-5-6-7-9_vs_4	477	51	8	9.35
vowel0	898	90	13	9.98
glass-0-1-6_vs_2	175	17	9	10.29
glass2	197	17	9	11.59
shuttle-c0-vs-c4	1706	123	9	13.87
yeast-1_vs_7	429	30	7	14.3
glass4	201	13	9	15.46
ecoli4	316	20	7	15.8
page-blocks-1-3_vs_4	444	28	10	15.86
abalone9-18	689	42	8	16.4
glass-0-1-6_vs_5	175	9	9	19.44
shuttle-c2-vs-c4	123	6	9	20.5
yeast-1-4-5-8_vs_7	663	30	8	22.1
glass5	205	9	9	22.78
yeast-2_vs_8	462	20	8	23.1
yeast4	1433	51	8	28.1
yeast-1-2-8-9_vs_7	917	30	8	30.57
yeast5	1440	44	8	32.73
ecoli-0-1-3-7_vs_2-6	274	7	7	39.14
yeast6	1449	35	8	41.4
abalone19	4142	32	8	129.44

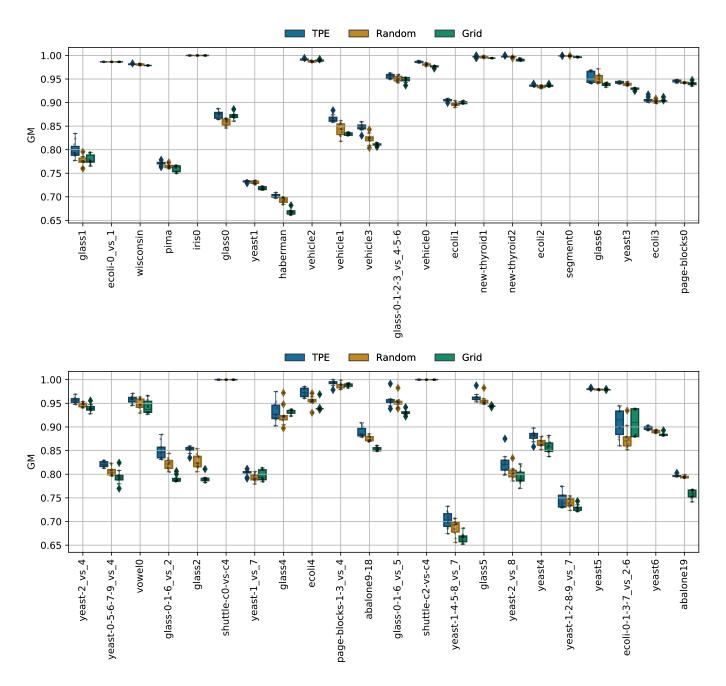


Fig. S-1. Box plots showing the distribution of GM for 44 datasets.

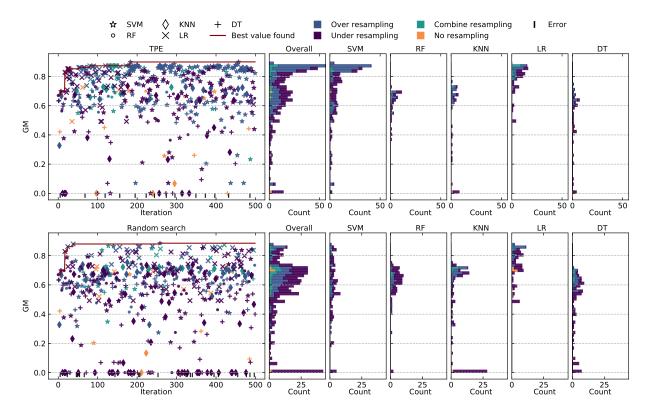


Fig. S-2. Dataset: abalone9-18 - run: 1

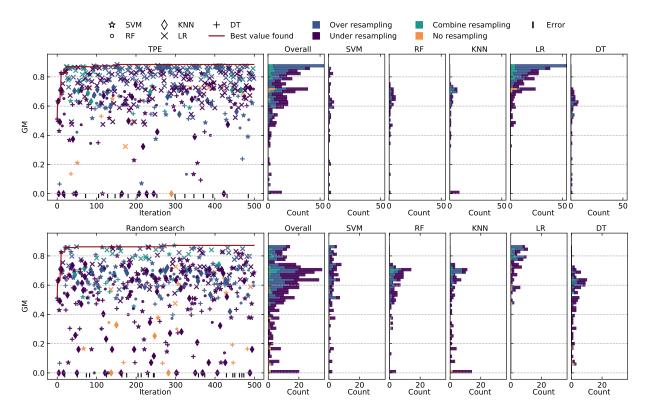


Fig. S-3. Dataset: abalone9-18 - run: 2

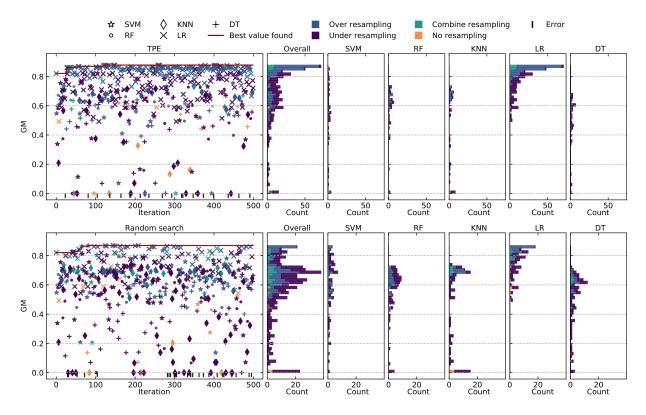


Fig. S-4. Dataset: abalone9-18 - run: 3

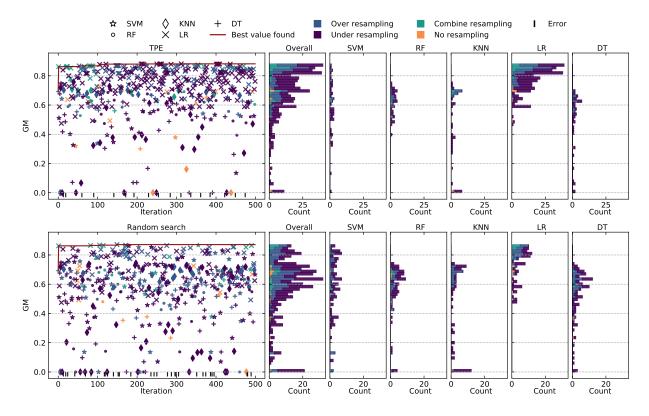


Fig. S-5. Dataset: abalone9-18 - run: 4

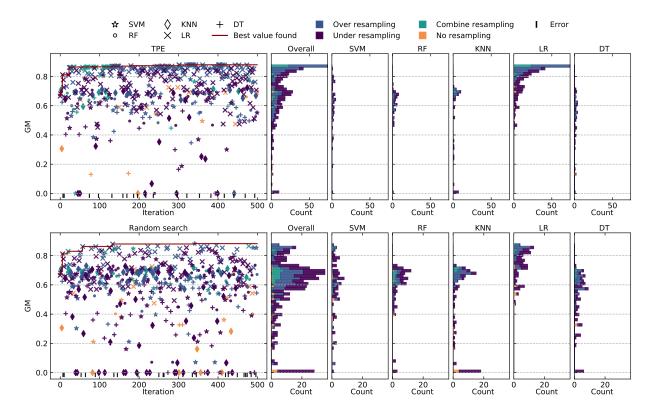


Fig. S-6. Dataset: abalone9-18 - run: 5

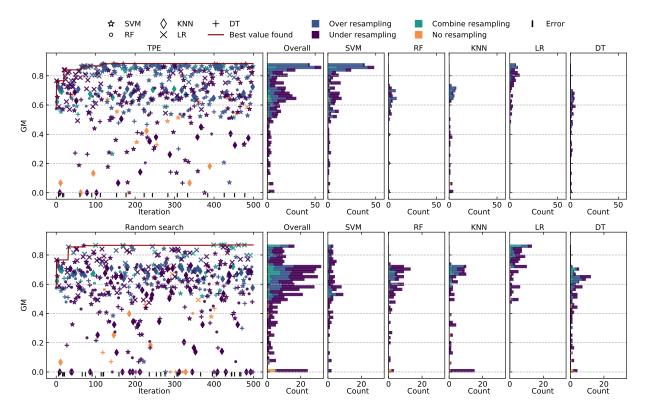


Fig. S-7. Dataset: abalone9-18 - run: 6

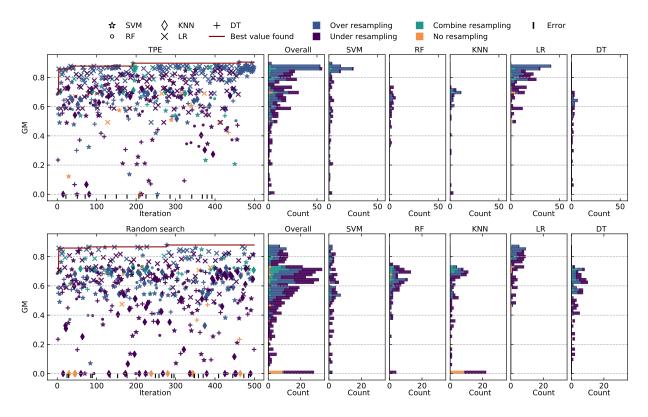


Fig. S-8. Dataset: abalone9-18 - run: 7

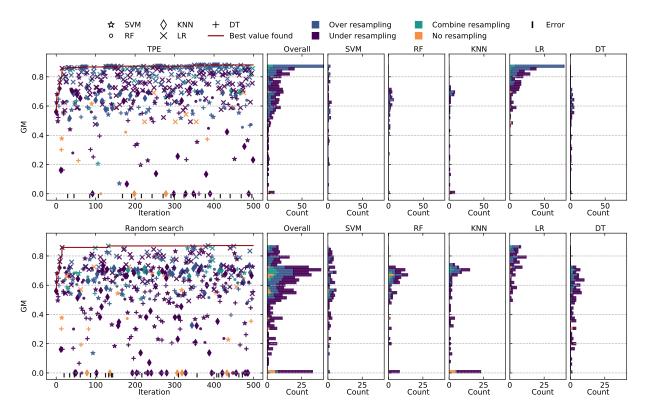


Fig. S-9. Dataset: abalone9-18 - run: 8

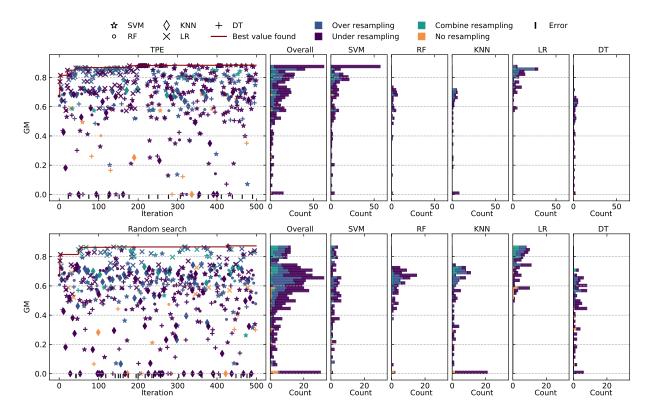


Fig. S-10. Dataset: abalone9-18 - run: 9

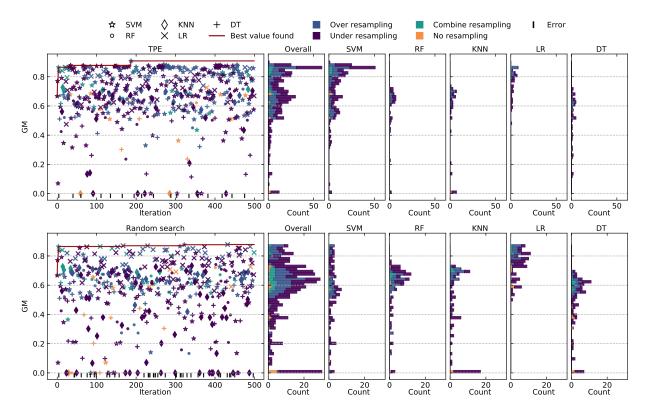


Fig. S-11. Dataset: abalone9-18 - run: 10

V. DETAILED RESULTS

This section presents the best configurations found from the three approaches (TPE, Random search, and Grid-Def) for 44 datasets, ordered by increasing IR value of the corresponding dataset. Each dataset's results present in a table, which includes the best-found configurations of 3 approaches over ten runs; thus, a table has $3\times 10=30$ rows. Note that, we choose the first found configuration in the case of more than one configuration at the highest GM.

TABLE S-5 "GLASS1"

Resampler

Method Seed Classifier

GM

Res.Group

Grid	_				
	9	RF	OneSidedSelection	Under	0.7753
				resampling	
Grid	18	RF	ADASYN	Over	0.7946
				resampling	
Grid	27	RF	SMOTENC	Over	0.7688
				resampling	
Grid	29	RF	KMeansSMOTE	Over	0.7653
				resampling	
Grid	36	RF	RandomUnderSampler	Under	0.7788
				resampling	
Grid	39	RF	SVMSMOTE	Over	0.7918
				resampling	
Grid	59	RF	SMOTETomek	Combine	0.7754
				resampling	
Grid	79	RF	BorderlineSMOTE	Over	0.776
				resampling	
Grid	90	RF	RandomOverSampler	Over	0.7935
				resampling	
Grid	109	RF	SMOTETomek	Combine	0.7733
				resampling	
Random	9	RF	SMOTE	Over	0.7749
				resampling	
{classifier	: {boots	trap: True, c	lass_weight: None, criter	rion: entropy, r	nax_features:
log2, min	_sample	s_leaf: 2, n	nin_samples_split: 8, n_e	stimators: 145	, name: RF,
random_st	ate: 9},	sub: {k_nei	ghbors: 5, random_state:	9, smo_grp: 0	OVER, type:
SMOTE } }					
Random	18	RF	RandomOverSampler	Over	0.7751
			1	resampling	
{classifier	: {boots	strap: False.	class_weight: balanced_		iterion: gini.
			les_leaf: 1, min_samples_s		
			ub: {random_state: 18, sm		
mOverSar		_5	au. (random_state: 10, sm	.o_g.p. o · z.r.,	type: rundo
	iipici j j				
Random	27	RF	SMOTE	Over	0.762
Random	27	RF	SMOTE	Over	0.762
				resampling	
{classifier	: {bootst	trap: True, cla	ass_weight: balanced, crite	resampling erion: entropy, r	nax_features:
{classifier log2, min	: {bootst	trap: True, cla s_leaf: 1, mir	ass_weight: balanced, crite n_samples_split: 3, n_estir	resampling erion: entropy, r mators: 107, na	nax_features: me: RF, ran-
{classifier log2, min dom_state	: {bootst _samples : 27}, s	trap: True, cla s_leaf: 1, mir	ass_weight: balanced, crite	resampling erion: entropy, r mators: 107, na	nax_features: me: RF, ran-
{classifier log2, min dom_state SMOTE}}	: {bootst _samples : 27},	trap: True, class_leaf: 1, minsub: {k_neight}	ass_weight: balanced, crite n_samples_split: 3, n_estir hbors: 8, random_state: 2	resampling erion: entropy, r mators: 107, na 27, smo_grp: 0	max_features: me: RF, ran- OVER, type:
{classifier log2, min dom_state SMOTE}}	: {bootst _samples : 27}, s	trap: True, cla s_leaf: 1, mir	ass_weight: balanced, crite n_samples_split: 3, n_estir	resampling erion: entropy, r nators: 107, na 27, smo_grp: 0	nax_features: me: RF, ran-
{classifier log2, min dom_state SMOTE}} Random	: {bootst _samples : 27}, s	trap: True, class_leaf: 1, minsub: {k_neig	ass_weight: balanced, crite 1_samples_split: 3, n_estir hbors: 8, random_state: 2	resampling rion: entropy, r mators: 107, na 27, smo_grp: 0	max_features: me: RF, ran- OVER, type:
{classifier log2, min dom_state SMOTE}} Random	: {bootst _samples : 27}, s - 29	trap: True, class_leaf: 1, minsub: {k_neig	ass_weight: balanced, crite 1_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter	resampling rion: entropy, r mators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r	max_features: me: RF, ran- OVER, type: 0.7598 max_features:
{classifier log2, min, dom_state SMOTE}} Random {classifier log2, min,	: {bootst _samples : 27}, s 29 : {boots _samples	trap: True, class_leaf: 1, minsub: {k_neig} RF trap: False, 6, s_leaf: 6, min	ass_weight: balanced, crite n_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter n_samples_split: 18, n_est	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran-
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state	: {bootst samples : 27}, s 29 : {boots samples : 29}, s	trap: True, class_leaf: 1, minsub: {k_neig} RF trap: False, 6, s_leaf: 6, min	ass_weight: balanced, crite 1_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran-
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}}	: {bootst _samples : 27}, s 29 : {boots _samples : 29}, s	rap: True, class_leaf: 1, minsub: {k_neig} RF trap: False, os_leaf: 6, minsub: {k_neig}	ass_weight: balanced, crite 1_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter 1_samples_split: 18, n_est hbors: 9, random_state: 2	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type:
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}}	: {bootst samples : 27}, s 29 : {boots samples : 29}, s	trap: True, class_leaf: 1, minsub: {k_neig} RF trap: False, 6, s_leaf: 6, min	ass_weight: balanced, crite n_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter n_samples_split: 18, n_est	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran-
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}}	: {bootst sample: 27}, s 29 : {boots sample: 29}: {boots sample: 29}, s 36	trap: True, class_leaf: 1, minsub: {k_neig} RF trap: False, os_leaf: 6, minsub: {k_neig}	ass_weight: balanced, criteral samples_split: 3, n_estinations: 8, random_state: 2 SMOTE class_weight: None, criteral samples_split: 18, n_estinations: 9, random_state: 2 SMOTENC	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling ion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling	nax_features: me: RF, ran- OVER, type: 0.7598 nax_features: me: RF, ran- OVER, type: 0.7766
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier	: {bootst sample: 27}, s : {bootst sample: 29} : {boots sample: 29}, s : {criteri	rrap: True, cles_leaf: 1, mir sub: {k_neig} RF trap: False, of s_leaf: 6, mir sub: {k_neig} DT ton: gini, max	ass_weight: balanced, critesamples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, critersamples_split: 18, n_est hbors: 9, random_state: 2 SMOTENCdepth: 9, max_features:	resampling rion: entropy, r mators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san	nax_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 aples_leaf: 5,
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier	: {bootst sample: 27}, s : {bootst sample: 29} : {boots sample: 29}, s : {criteri	rrap: True, cles_leaf: 1, mir sub: {k_neig} RF trap: False, of s_leaf: 6, mir sub: {k_neig} DT ton: gini, max	ass_weight: balanced, criteral samples_split: 3, n_estinations: 8, random_state: 2 SMOTE class_weight: None, criteral samples_split: 18, n_estinations: 9, random_state: 2 SMOTENC	resampling rion: entropy, r mators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san	nax_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 aples_leaf: 5,
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp	: {bootst _samples : 27}, s 29 : {boots _samples : 29}, s 36 : {criteriles_split	rap: True, class leaf: 1, mir sub: {k_neig} RF trap: False, o s_leaf: 6, mir sub: {k_neig} DT ton: gini, man: 7, name: DT	ass_weight: balanced, critesamples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, critersamples_split: 18, n_est hbors: 9, random_state: 2 SMOTENCdepth: 9, max_features:	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r nators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fe}	nax_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 aples_leaf: 5,
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbox	: {bootst _samples : 27}, s 29 : {boots _samples : 29}, s 36 : {criteriles_split	rap: True, class leaf: 1, mir sub: {k_neig} RF trap: False, o s_leaf: 6, mir sub: {k_neig} DT ton: gini, man: 7, name: DT	ass_weight: balanced, crite 1_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter 1_samples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r nators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fe}	nax_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 aples_leaf: 5,
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbc} Random	: {bootsts_samples: 27}, s 29 : {boots_samples: 29}, s 36 : {criteriles_split prs: 6, ra 39	rrap: True, classes leaf: 1, mir sub: {k_neig} RF trap: False, os s_leaf: 6, mir sub: {k_neig} DT on: gini, max: 7, name: DI ndom_state: 1	ss_weight: balanced, critesamples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, critersamples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC depth: 9, max_features: C, random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN	resampling rion: entropy, r mators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fo SMOTENC}} Over resampling	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 aples_leaf: 5, eatures: True, 0.784
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbc} Random	: {bootsts_samples: 27}, s 29 : {boots_samples: 29}, s 36 : {criteriles_split prs: 6, ra 39	rrap: True, classes leaf: 1, mir sub: {k_neig} RF trap: False, os s_leaf: 6, mir sub: {k_neig} DT on: gini, max: 7, name: DI ndom_state: 1	ss_weight: balanced, critesamples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, critersamples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC depth: 9, max_features: C, random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN	resampling rion: entropy, r mators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fo SMOTENC}} Over resampling	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 aples_leaf: 5, eatures: True, 0.784
{classifier log2, min, dom_state SMOTE}} Random {classifier log2, min, dom_state SMOTE}} Random {classifier min_samp k_neighbo Random {classifier	: {bootst sample: 27}, s 29 : {boots sample: 29}, s 36 : {criteriles_split brs: 6, ra 39 : {boots sample: 29}, s	rap: True, classeleaf: 1, mir sub: {k_neig} RF trap: False, os s_leaf: 6, mir sub: {k_neig} DT ton: gini, man: DT ndom_state: 1 RF trap: False, os s_leaf: 6, mir sub: 4k_neig}	ass_weight: balanced, critersamples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, critersamples_split: 18, n_est hbors: 9, random_state: 2 SMOTENCdepth: 9, max_features: C, random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN class_weight: balanced, cr	resampling rion: entropy, r mators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fc SMOTENC}} Over resampling resampling riterion: gini, r	nax_features: me: RF, ran- OVER, type: 0.7598 nax_features: me: RF, ran- OVER, type: 0.7766 nples_leaf: 5, eatures: True, 0.784 nax_features:
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbor Random {classifier 1, min_sa	: {bootst_sample: : 27}, s 29 : {bootst_sample: : 27}, s 29 : {bootst_sample: : 29}, s 36 : {criteriles_split ors: 6, ra 39 : {bootst_sample: : 29}, s	rap: True, class leaf: 1, mir sub: {k_neig} RF trap: False, os sleaf: 6, mir sub: {k_neig} DT ton: gini, man: DT ndom_state: 1 RF trap: False, os eaf: 4, min_state, 4, min_state, 1	ass_weight: balanced, crite 1_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter 1_samples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rimators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fe SMOTENC}} Over resampling resampling resampling iterion: gini, r ators: 120, nar	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 mples_leaf: 5, eatures: True, 0.784 max_features: me: RF, ran-
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbor Random {classifier min_samp dom_state smoother logation in l	: {bootst sample: : 27}, s 29 : {boots sample: : 29}, s 36 : {criteriles_split les_split	rap: True, class leaf: 1, mir sub: {k_neig} RF trap: False, os sleaf: 6, mir sub: {k_neig} DT ton: gini, man: DT ndom_state: 1 RF trap: False, os eaf: 4, min_state, 4, min_state, 1	ass_weight: balanced, critersamples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, critersamples_split: 18, n_est hbors: 9, random_state: 2 SMOTENCdepth: 9, max_features: C, random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN class_weight: balanced, cr	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rimators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fe SMOTENC}} Over resampling resampling resampling iterion: gini, r ators: 120, nar	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 mples_leaf: 5, eatures: True, 0.784 max_features: me: RF, ran-
{classifier log2, min, dom_state SMOTE}} Random {classifier log2, min, dom_state SMOTE}} Random {classifier min_samp k_neighbo Random {classifier min_sandom_state ADASYN	: {bootst_sample: : 27}, s 29 : {bootst_sample: : 27}, s : {boots sample: : 36} : {criteriles_split bors: 6, ra 39 : {boots samples_lo: : 39}, s }}	rap: True, cl: _leaf: 1, min sub: {k_neig' RF trap: False, e _leaf: 6, min sub: {k_neig' DT lon: gini, man : 7, name: DT ndom_state: 1 RF trap: False, e eaf: 4, min_ sub: {n_neig'	ass_weight: balanced, criter n.samples_split: 3, n_estim hbors: 8, random_state: 2 SMOTE class_weight: None, criter n_samples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC c_depth: 9, max_features: 7, random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN class_weight: balanced, criter n.samples_split: 9, n_estim hbors: 7, random_state: 2	resampling rion: entropy, r na 27, smo_grp: 0 Over resampling ion: entropy, r nators: 107, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_ft SMOTENC} Over resampling riterion: gini, r ators: 120, na 39, smo_grp: 0	nax_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 nples_leaf: 5, eatures: True, 0.784 max_features: me: RF, ran- OVER, type:
{classifier log2, min, dom_state SMOTE}} Random {classifier log2, min, dom_state SMOTE}} Random {classifier min_samp k_neighbo Random {classifier min_sadom_state ADASYN	: {bootst sample: : 27}, s 29 : {boots sample: : 29}, s 36 : {criteriles_split les_split	rap: True, class leaf: 1, mir sub: {k_neig} RF trap: False, os sleaf: 6, mir sub: {k_neig} DT ton: gini, man: DT ndom_state: 1 RF trap: False, os eaf: 4, min_state, 4, min_state, 1	ass_weight: balanced, crite 1_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter 1_samples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC	resampling rion: entropy, r mators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fi SMOTENC}} Over resampling riterion: gini, r ators: 120, nar 39, smo_grp: 0	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 mples_leaf: 5, eatures: True, 0.784 max_features: me: RF, ran-
{classifier log2, min, dom_state SMOTE}} Random {classifier min_samp k_neighbor Random {classifier min_samp k_neighbor Random {classifier 1, min_sa dom_state ADASYN Random	29 : {bootst sample: : 27}, s	rap: True, class leaf: 1, mir sub: {k_neig} RF trap: False, os s_leaf: 6, mir sub: {k_neig} DT ton: gini, man: 7, name: DT ndom_state: 1 RF trap: False, os eaf: 4, min_sub: {n_neig} RF	ass_weight: balanced, criter asamples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter a_samples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC c_depth: 9, max_features: C, random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN class_weight: balanced, criter asamples_split: 9, n_estim hbors: 7, random_state: 2 SMOTENC	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rimators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fe SMOTENC}} Over resampling riterion: gini, r ators: 120, nar 39, smo_grp: 0 Over resampling	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 mples_leaf: 5, eatures: True, 0.784 max_features: me: RF, ran- OVER, type: 0.7858
{classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbor Random {classifier min_samp k_neighbor Random {classifier nom_state ADASYN Random {classifier formula in min_samp k_neighbor Random {classifier nom_state ADASYN Random {classifier dassifier formula in min_samp k_neighbor Random {classifier nom_state ADASYN Random {classifier formula in min_state ADASYN Random {classifier	: {bootst sample: : 27}, s	rap: True, class leaf: 1, mir sub: {k_neig} RF trap: False, os sleaf: 6, mir sub: {k_neig} DT trap: False, os sleaf: 6, mir sub: {k_neig} rap: True, class leaf: 6, mir sub: 17, name: DT ndom_state: 17 RF trap: False, os eaf: 4, min_sub: {n_neig} RF sub: {n_neig}	ass_weight: balanced, crite 1_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter 1_samples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC	resampling rion: entropy, r nators: 107, na 27, smo_grp: 0 Over resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fc SMOTENC}} Over resampling riterion: gini, r ators: 120, nar 39, smo_grp: 0 Over resampling subsample, cri	max_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 mples_leaf: 5, eatures: True, 0.784 max_features: me: RF, ran- OVER, type: 0.7858
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbor Random {classifier 1, min_sa dom_state ADASYN Random {classifier max_feature max_feature log2, min_sa dom_state ADASYN Random {classifier max_feature max_feature log2, min_sa dom_state ADASYN Random {classifier m	: {bootst_sample: : 27}, s : {bootst_sample: : 27}, s : {boots_sample: : 29}, s : {boots_sample: : 36} : {criteriles_split ors: 6, ra 39} : {boots_loss_split ors: 6, ra 39} : {boots_cres: 1, rs	rap: True, cl: _leaf: 1, min sub: {k_neig' RF trap: False, e _leaf: 6, min sub: {k_neig' DT ton: gini, man : 7, name: DI ndom_state: 1 RF trap: False, e eaf: 4, min_ sub: {n_neig' RF sub: {n_neig'	ass_weight: balanced, criter n_samples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter n_samples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC c_depth: 9, max_features: CC, random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN class_weight: balanced, criter hbors: 7, random_state: 3 SMOTENC class_weight: balanced_class_split: 9, n_estiments hbors: 7, random_state: 3 SMOTENC class_weight: balanced_class_weight: balanced_class_split: 9, n_estiments hbors: 7, random_state: 3	resampling rion: entropy, r non: entropy, r resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fs SMOTENC} Over resampling riterion: gini, r ators: 120, nar 39, smo_grp: 0 Over resampling subsample, cri: 2, n_estimato	nax_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 nples_leaf: 5, eatures: True, 0.784 max_features: me: RF, ran- OVER, type: 0.7858 iterion: gini, rs: 80, name:
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbc Random} {classifier 1, min_sa dom_state ADASYN Random}	: {bootst_sample: : 27}, s : 29 : {boots sample: : 29}, s : {boots sample: : 29}, s : {criteriles_split rs: 6, ra 39 : {boots sample: : 59} : {boots mples_le: : 39}	rap: True, cls_leaf: 1, mirsub: {k_neig} RF trap: False, os_leaf: 6, mirsub: {k_neig} DT ton: gini, mar: 7, name: DT ndom_state: 3 RF trap: False, os_leaf: 4, min_sub: {n_neig} RF strap: True, cls_leaf: 4, min_samples_59}, sub: {ca}	ass_weight: balanced, criter assmples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, criter a_samples_split: 18, n_est hbors: 9, random_state: 2 SMOTENC c_depth: 9, max_features: C_c_random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN class_weight: balanced, criter amples_split: 9, n_estim hbors: 7, random_state: 2 SMOTENC class_weight: balanced_criter class_weight: 5, n_estim hbors: 7, random_state: 2 SMOTENC class_weight: balanced_leaf: 1, min_samples_split tegorical_features: True, k	resampling rion: entropy, r non: entropy, r resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fs SMOTENC} Over resampling riterion: gini, r ators: 120, nar 39, smo_grp: 0 Over resampling subsample, cri: 2, n_estimato	nax_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 nples_leaf: 5, eatures: True, 0.784 max_features: me: RF, ran- OVER, type: 0.7858 iterion: gini, rs: 80, name:
{classifier log2, min dom_state SMOTE}} Random {classifier log2, min dom_state SMOTE}} Random {classifier min_samp k_neighbc Random} {classifier 1, min_sa dom_state ADASYN Random}	: {bootst_sample: : 27}, s : 29 : {boots sample: : 29}, s : {boots sample: : 29}, s : {criteriles_split rs: 6, ra 39 : {boots sample: : 59} : {boots mples_le: : 39}	rap: True, cl: _leaf: 1, min sub: {k_neig' RF trap: False, e _leaf: 6, min sub: {k_neig' DT ton: gini, man : 7, name: DI ndom_state: 1 RF trap: False, e eaf: 4, min_ sub: {n_neig' RF sub: {n_neig'	ass_weight: balanced, critersamples_split: 3, n_estir hbors: 8, random_state: 2 SMOTE class_weight: None, critersamples_split: 18, n_est hbors: 9, random_state: 2 SMOTENCdepth: 9, max_features: C, random_state: 36}, sub 36, smo_grp: OVER, type: ADASYN class_weight: balanced, criter samples_split: 9, n_estim hbors: 7, random_state: 3 SMOTENC class_weight: balanced, criter class_weight: balanced, criter land criter class_weight: 5, n_estim hbors: 7, random_state: 3 SMOTENC class_weight: balanced_leaf: 1, min_samples_split tegorical_features: True, k OTENC}}	resampling rion: entropy, r non: entropy, r resampling rion: entropy, r imators: 70, na 29, smo_grp: 0 Over resampling None, min_san : {categorical_fs SMOTENC} Over resampling riterion: gini, r ators: 120, nar 39, smo_grp: 0 Over resampling subsample, cri: 2, n_estimato	nax_features: me: RF, ran- OVER, type: 0.7598 max_features: me: RF, ran- OVER, type: 0.7766 nples_leaf: 5, eatures: True, 0.784 max_features: ne: RF, ran- OVER, type: 0.7858 iterion: gini, rs: 80, name: andom_state:

continued on the next column

TABLE S-5
"GLASS1" – CONTINUED FROM PREVIOUS COLUMN

	"GLA	SSI" – CON	TINUED FROM PRE	VIOUS COLUI	MN
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	79	RF	SVMSMOTE	Over	0.773
(-1'6	(1	F-1	.1	resampling	
			class_weight: balanced s_leaf: 2, min_sample		
			, sub: {k_neighbors:		
			state: 79, smo_grp: OV		
Random	90	RF	SMOTE	Over	0.7764
[classifier:	[bootet	ran: True, cla	ss_weight: balanced, c	resampling	av fasturas: cart
			oles_split: 3, n_estimate		
			lom_state: 90, smo_gr		
Random	109	RF	CondensedNearest	Under	0.7955
(-1'6	(1	T	Neighbour	resampling	
{classifier:			class_weight: balanc leaf: 2, min_samples_s		
			{n_neighbors: 19, n_s		
			ensedNearestNeighbour		
TPE	9	RF	ADASYN	Over	0.7933
(alassifiam	Chaote	tuon. Tuo	alass maishte halans	resampling	
			class_weight: balance leaf: 2, min_samples_s		
			neighbors: 2, random_		
ADASYN}		- ,,, (_			, , , , , ,
TPE	18	RF	SMOTETomek	Combine	0.7892
(alaa-if-	(lho-t-r		as maisht t-11	resampling	ov. factours:
			ss_weight: balanced, ca bles_split: 6, n_estimate		
			no_grp: COMBINE, ty		
TPE	27	RF	CondensedNearest	Under	0.8342
			Neighbour	resampling	
			class_weight: None, c		
			oles_split: 7, n_estimato eeds_S: 10, random_sta		
		Neighbour}}	ccus_5. 10, randoni_st	atc. 27, 3110_g1	p. ONDER, type.
	29	RF	CondensedNearest	Under	0.8235
			Neighbour	resampling	
			class_weight: balance		
			leaf: 7, min_samples_s {n_neighbors: 29, n_s		
			ensedNearestNeighbour		andom_state. 29,
TPE	36	KNN	SMOTENC	Over	0.777
				resampling	
			e, n_neighbors: 13, nam		
		ype: SMOTE	orical_features: True, k ENC}}	_neignbors: 4, i	andom_state: 56,
TPE	39	RF	SMOTENC	Over	0.7928
				resampling	
			class_weight: None, c		
			_samples_split: 11, n_		
		ub: {categori ype: SMOTE	cal_features: True, k_i ENC}}	neignoofs: /, f	andoni_state: 59,
TPE	59	RF	CondensedNearest	Under	0.787
			Neighbour	resampling	
			ass_weight: balanced,		
			n_samples_split: 4, n_o		
			<pre>ibors: 24, n_seeds_S: estNeighbour}}</pre>	o, random_sta	33, sino_gip:
TPE TPE	79	RF	BorderlineSMOTE	Over	0.7928
				resampling	
•		•	class_weight: balanced		
			leaf: 1, min_samples_s k_neighbors: 6, kind:		
	_		ER, type: BorderlineS		m_neignoors: 3,
	90	RF	SMOTENC	Over	0.8113
				resampling	
			class_weight: balance	ed_subsample,	
			oles_leaf: 1, min_sam		
			<pre>sub: {categorical_feator k, type: SMOTENC}}</pre>	ires: irue, k_n	eignoors: 1, ran-
TPE	109	RF	SMOTETomek	Combine	0.7882
				resampling	
			class_weight: None, c	riterion: entrop	
			n_samples_split: 10, n		
dom_state: Tomek}}	109},	sub: {rando	m_state: 109, smo_gr	p. COMBINE	, type: SMOTE-
romek}}					

TABLE S-6 "ECOLI-0_VS_1" – CONTINUED FROM PREVIOUS COLUMN

TABLE S-6 "ECOLI-0_VS_1"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	RF	No	No	0.9864
			resampling	resampling	
Grid	18	RF	No	No	0.9864
			resampling	resampling	
Grid	27	RF	No	No	0.9864
~	• •		resampling	resampling	
Grid	29	RF	No	No	0.9864
0:1	26	DE	resampling	resampling	0.0064
Grid	36	RF	OneSidedSelection	Under	0.9864
Grid	39	RF	No	resampling	0.0964
Giid	39	KI.		No	0.9864
Grid	59	RF	resampling KMeansSMOTE	resampling Over	0.9864
Giiu	39	KI [*]	KivicalissiviOTE	resampling	0.9604
Grid	79	RF	CondensedNearest	Under	0.9864
Ond	' /	IXI	Neighbour	resampling	0.7004
Grid	90	RF	SMOTEENN	Combine	0.9864
Ona	'	1	Silio I E E I I I	resampling	0.500.
Grid	109	RF	EditedNearest	Under	0.9864
			Neighbours	resampling	
Random	9	DT	SMOTEENN	Combine	0.9864
				resampling	
{classifier	: {criteri	on: entropy, n	nax_depth: 13, max_featur		samples_leaf:
18, min_s	samples_	split: 5, nan	ne: DTC, random_state:	9}, sub: {ranc	lom_state: 9,
		NE, type: SM			
Random	18	DT	EditedNearest	Under	0.9864
			Neighbours	resampling	
{classifier	: {criteri	on: entropy, r	nax_depth: 5, max_featur	es: None, min_	samples_leaf:
14, min_	samples_	_split: 7, nai	me: DTC, random_state:	18}, sub: {1	kind_sel: all,
n_neighbo	ors: 7, sn	no_grp: UND	ER, type: EditedNearestN	eighbours}}	
Random	27	RF	SMOTETomek	Combine	0.9864
				resampling	
			ss_weight: balanced, criter		
			les_split: 7, n_estimators:		
			no_grp: COMBINE, type:		
Random	29	RF	KMeansSMOTE	Over	0.9864
				resampling	
{classifier			class_weight: balanced_		
			es_leaf: 11, min_samples		
			ib: {cluster_balance_thres		
			9, smo_grp: OVER, type:		
Random	36	RF	AllKNN	Under	0.9864
(-1 'C	. (1	T	1i-1 Ni	resampling	C4
			lass_weight: None, criter		
			nin_samples_split: 13, n_		
			minority: True, kind_sel:	aii, n_neignbors	:: 3, smo_grp:
UNDER,			Don dom OrronCom -1	Ovion	0.0064
Random	39	RF	RandomOverSampler	Over	0.9864
(alacaif -	, (hart	otron. Tens	alone waights balanced	resampling	itarian: ~in'
Classiner	. {0000	suap: True,	class_weight: balanced_	subsample, cr	nerion: gini,
			les_leaf: 2, min_samples_		
domOvers			sub: {random_state: 39, s	smo_grp: OvEl	x, type: Kan-
			AHIZADA	YY 1	0.0064
Random	59	DT	AllKNN	Under	0.9864
[classifier	· (oritori	on: entropy =	 nax_depth: 11, max_featur	resampling	complee loof.
			DTC, random_state: 59},		mority. Faise,
			no_grp: UNDER, type: A		0.0074
Random	79	RF	RandomUnderSampler	Under	0.9864
(alacaif -	 	ron. True -1-	ss_weight: None, criterio	resampling	oturos None
			nss_weight: None, criterio mples_split: 12, n_estim		
			state: 79, replacement: Fal		
RandomU			нас. 13, теріасешені. Га	sc, smo_grp: C	TIDER, type:
NanuoniiU	nucisan	ihici } }			

continued on the next column

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	AllKNN	Under resampling	0.9864
{classifier	· {boots	stran: False	class_weight: balanced_		iterion: gini
			les_leaf: 16, min_samples		
			sub: {allow_minority: True		
		ER, type: All		,,	
Random	109	RF	SMOTEENN	Combine	0.9864
				resampling	
{classifier	: {boots	trap: True, o	class_weight: balanced_su	bsample, criter	ion: entropy
			es_leaf: 14, min_samples_		
		_state: 109},	sub: {random_state: 109,	smo_grp: COM	MBINE, type
SMOTEE					
TPE	9	RF	ClusterCentroids	Under	0.9864
(-1: C	. (1	t F-1	1	resampling	£
			class_weight: None, criter		
			nin_samples_split: 7, n_e ator: MiniBatchKMeans,		
			s, voting: hard}}	random_state.	9, smo_grp
TPE	18	DT	EditedNearest	Under	0.9864
11 L	10	101	Neighbours	resampling	0.700-
{classifier	: {criteri	on: entropy, i	max_depth: 5, max_feature		samples_leaf
			me: DTC, random_state:		
			ER, type: EditedNearestN		
TPE	27	RF	SMOTETomek	Combine	0.9864
				resampling	
			ss_weight: balanced, criter		
			oles_split: 7, n_estimators:		
	{random	_state: 27, sr	no_grp: COMBINE, type:		
TPE	29	RF	KMeansSMOTE	Over	0.9864
	L		L	resampling	
			class_weight: balanced_		
			es_leaf: 11, min_samples	_spiit: 18, n_es	sumators: 73
name. Kr,				2014: 0 1959003	72/0761070
l naighbo			ub: {cluster_balance_thresl		
	ors: 4, ra	ndom_state: 2	29, smo_grp: OVER, type:	KMeansSMO	ΓE}}
k_neighbo TPE				KMeansSMO Under	ΓE}}
TPE	36 36	ndom_state: 2	29, smo_grp: OVER, type: AllKNN	KMeansSMOT Under resampling	TE}} 0.9864
TPE {classifier	36 : {boots	RF trap: True, o	29, smo_grp: OVER, type:	KMeansSMOT Under resampling ion: entropy, 1	TE}} 0.9864 max_features
TPE {classifier None, mi random_st	36 : {boots n_sample tate: 36}.	RF trap: True, ces_leaf: 1, n, sub: {allow_	29, smo_grp: OVER, type: AllKNN class_weight: None, criter	Under resampling ion: entropy, 1 estimators: 133	TE}} 0.9864 max_features name: RF
TPE {classifier None, mi random_st UNDER,	rs: 4, ra: 36 : {boots n_sample tate: 36}; type: All	ndom_state: 2 RF trap: True, c es_leaf: 1, n , sub: {allow_ IKNN}}	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a	KMeansSMOT Under resampling ion: entropy, restimators: 133 all, n_neighbors	0.9864 max_features 3, name: RF : 3, smo_grp
TPE {classifier None, mi random_st	36 : {boots n_sample tate: 36}.	RF trap: True, ces_leaf: 1, n, sub: {allow_	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_	KMeansSMOT Under resampling ion: entropy, restimators: 133 all, n_neighbors	0.9864 max_features 3, name: RF : 3, smo_grp
TPE {classifier None, mi random_st UNDER, TPE	rs: 4, ra: 36 : {boots n_sample tate: 36}: type: All 39	rdom_state: 2 RF trap: True, c es_leaf: 1, n , sub: {allow_ IKNN}} RF	29, smo_grp: OVER, type: AllKNN lass_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling	0.9864 nax_features 3, name: RF : 3, smo_grp
TPE {classifier None, mi random_st UNDER, TPE {classifier	rs: 4, raid 36 is {boots n_sample tate: 36}. type: All 39 is {boots sample tate: 36}.	ndom_state: 2 RF trap: True, c es_leaf: 1, n , sub: {allow_ IKNN}} RF trap: True, c	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter	nax_features name: RF 0.9864 0.9864 0.9864
TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu	rs: 4, ra 36 : {boots n_sample tate: 36} type: All 39 : {boots ures: 1, m	ndom_state: 2 RF trap: True, c es_leaf: 1, n , sub: {allow_lKNN}} RF trap: True, c	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su eaf: 2, min_samples_split:	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator	D.9864 nax_features name: RF 3, smo_grp 0.9864 ion: entropy ss: 126, name
TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu RF, random	rs: 4, ra 36 : {boots n_sample tate: 36}. type: All 39 : {boots nres: 1, mr m_state:	ndom_state: 2 RF trap: True, c es_leaf: 1, n , sub: {allow_ IKNN}} RF trap: True, c iin_samples_1 39}, sub: {ra	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator	D.9864 nax_features name: RF 3, smo_grp 0.9864 ion: entropy ss: 126, name
TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu RF, randot type: Randot	rs: 4, ra 36 : {boots n_sample tate: 36}. type: All 39 : {boots ures: 1, m m_state: domUnd	ndom_state: 2 RF trap: True, c es_leaf: 1, n s sub: {allow_ IKNN}} RF trap: True, c inin_samples_1 39}, sub: {ra erSampler}}	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su eaf: 2, min_samples_split: ndom_state: 39, replaceme	KMeansSMOT Under resampling ion: entropy, restimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator int: True, smo_s	nax_features 0.9862 max_features 0.9862 0.9862 ion: entropy s: 126, name
TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu RF, randot type: Randot	rs: 4, ra 36 : {boots n_sample tate: 36}. type: All 39 : {boots nres: 1, mr m_state:	ndom_state: 2 RF trap: True, c es_leaf: 1, n , sub: {allow_ IKNN}} RF trap: True, c iin_samples_1 39}, sub: {ra	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su eaf: 2, min_samples_split:	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator ent: True, smo_{1} Under	nax_features 0.9862 max_features 0.9862 0.9862 ion: entropy s: 126, name
TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu RF, randor type: Rand TPE	ors: 4, ra 36 : {boots n_sample tate: 36}. type: All 39 : {boots m_state: 4, ra m_state: 4, ra domUnd 59	ndom_state: 2 RF trap: True, ces_leaf: 1, n, sub: {allow_IKNN}} RF trap: True, coin_samples_1 39], sub: {raerSampler}} DT	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su eaf: 2, min_samples_split: ndom_state: 39, replacement	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator ent: True, smo_g Under resampling	0.9862 nax_features name: RF
TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu RF, randor type: Rand TPE {classifier	ors: 4, ra 36 : {boots n_sample tate: 36}. type: All 39 : {boots ures: 1, n m_state: domUnd 59 : {criteri	ndom_state: 2 RF trap: True, c es_leaf: 1, n , sub: {allow_ikNN}} RF trap: True, c iin_samples_1 39}, sub: {ra erSampler} DT on: entropy, n	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su eaf: 2, min_samples_split: ndom_state: 39, replaceme AllKNN nax_depth: 11, max_featur	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator ent: True, smo_g Under resampling es: None, min_	nax_features , name: RF : 3, smo_grp 0.9864 ion: entropy s: 126, name grp: UNDER 0.9864 samples_leaf
TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu RF, randot type: Rand TPE {classifier 10, min_sa	ors: 4, ra 36 : {boots n_sample tate: 36} type: All 39 : {boots res: 1, rr m_state: domUnd 59 : {criteri amples_s	ndom_state: 2 RF trap: True, c es_leaf: 1, n s, sub: {allow_liKNN}} RF trap: True, c iin_samples_1 39}, sub: {ra erSampler} DT on: entropy, r split: 4, name:	29, smo_grp: OVER, type: AllKNN class_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su eaf: 2, min_samples_split: ndom_state: 39, replaceme AllKNN nax_depth: 11, max_featur t DTC, random_state: 59},	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator ent: True, smo_g Under resampling es: None, min_ sub: {allow_mi}	nax_features , name: RF : 3, smo_grp 0.9864 ion: entropy s: 126, name grp: UNDER 0.9864 samples_leaf
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TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu RF, rando type: Rand TPE {classifier 10, min_st kind_sel:	ors: 4, ra 36 : {boots n_sample tate: 36}. type: All 39 : {boots rm_state: domUnd 59 : {criteri amples_sall, n_ne	ndom_state: 2 RF trap: True, c es_leaf: 1, n, sub: {allow_ IKNN}} RF trap: True, c in_samples_1 age; sub: {ra erSampler}} DT on: entropy, r split: 4, name: ighbors: 6, si	29, smo_grp: OVER, type: AllKNN lass_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su eaf: 2, min_samples_split: ndom_state: 39, replaceme AllKNN max_depth: 11, max_featur to DTC, random_state: 59}, mo_grp: UNDER, type: A	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator ent: True, smo_g Under resampling es: None, min_ sub: {allow_mi	nax_features nax_features name: RF 3, smo_grp 0.986- ion: entropy 126, name grp: UNDER 0.986- 0.986- ion: entropy 126, name ion: entropy 126, name 127, name 128, name 129,
TPE {classifier None, mi random_st UNDER, TPE {classifier max_featu RF, rando type: Rand TPE {classifier 10, min_st kind_sel: TPE	ors: 4, ra 36 : {boots n_sample tate: 36} type: All 39 : {boots ures: 1, m m_state: domUnd 59 : {criteri amples_sall, n_ne 79	ndom_state: 2 RF trap: True, cc es_leaf: 1, n , sub: {allow_IKNN}} RF trap: True, c nin_samples_1 391, sub: {ra erSampler}} DT on: entropy, r split: 4, name: eighbors: 6, si RF	29, smo_grp: OVER, type: AllKNN lass_weight: None, criter nin_samples_split: 13, n_ minority: True, kind_sel: a RandomUnderSampler class_weight: balanced_su eaf: 2, min_samples_split: ndom_state: 39, replaceme AllKNN max_depth: 11, max_featur to DTC, random_state: 59}, mo_grp: UNDER, type: A	KMeansSMOT Under resampling ion: entropy, 1 estimators: 133 all, n_neighbors Under resampling bsample, criter 15, n_estimator ent: True, smo_g Under resampling es: None, min_ sub: {allow_mi} IKNN} Under resampling	0.9864 nax_features 0.9864 0.9864 0.9864 0.9864 0.9864 0.9864
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TABLE S-7 "WISCONSIN"

	Seed	Classifier	Resampler	Res.Group	GN
Grid	9	LR	Instance	Under	0.978
C : 1	10	I D	HardnessThreshold	resampling	0.070
Grid	18	LR	Instance	Under	0.978
C.: 1	27	T.D.	HardnessThreshold	resampling	0.070
Grid	27	LR	Instance	Under	0.978
Grid	29	LR	HardnessThreshold Instance	resampling Under	0.070
Gria	29	LK			0.978
Caid	36	LR	HardnessThreshold	resampling Under	0.978
Grid	30	LK	Instance HardnessThreshold		0.978
Grid	39	LR	Instance	resampling Under	0.978
Giiu	39	LK	HardnessThreshold	resampling	0.976
Grid	59	LR	Instance	Under	0.978
Ond	37	LK	HardnessThreshold	resampling	0.570
Grid	79	LR	Instance	Under	0.978
oa	' '	211	HardnessThreshold	resampling	0.570
Grid	90	LR	Instance	Under	0.978
Ona	'	211	HardnessThreshold	resampling	0.570
Grid	109	LR	Instance	Under	0.978
			HardnessThreshold	resampling	
Random	9	SVM	Neighbourhood	Under	0.982
			CleaningRule	resampling	
{classifier	: {C: 67	.70882698732	2748, coef0: 0.624961°	7016676856, de	egree: 2, gamma
			8803917089, kernel:		
			shrinking: False, tol		
			DER, threshold_cleani		
. – -		eaningRule}}	, <u>-</u>	8	
Random	18	RF	SVMSMOTE	Over	0.981
rundom	10	144	5 / 11151110 12	resampling	0.501
{classifier	: {bootst	rap: False, cl	ass_weight: balanced,		ov. max feature:
			samples_split: 14, n_6		
			ors: 8, m_neighbors: 6,		
_		. – -	ER, type: SVMSMOT		11//05/511010
Random_st	27	RF	AllKNN	Under	0.979
rundom	-	I CI	7 HILL VII	resampling	0.575
(1 '0					
¿classifier	· {boots	tran: True cl:	ass weight halanced a	criterion: entror	y may feature
			ass_weight: balanced, or samples split: 15 n		
1, min_sa	mples_le	eaf: 10, min_	_samples_split: 15, n_	estimators: 69,	name: RF, rar
1, min_sa dom_state	mples_le: 27}, si	eaf: 10, min_ ub: {allow_m		estimators: 69,	name: RF, rar
1, min_sa dom_state UNDER,	mples_le: 27}, sitype: Al	eaf: 10, min_ ub: {allow_m IKNN}}	_samples_split: 15, n_ inority: False, kind_se	estimators: 69, l: all, n_neighb	name: RF, rar pors: 2, smo_grp
1, min_sa dom_state UNDER,	mples_le: 27}, si	eaf: 10, min_ ub: {allow_m	_samples_split: 15, n_	estimators: 69, l: all, n_neighb	name: RF, rar pors: 2, smo_grp
1, min_sa dom_state UNDER, Random	mples_le : 27}, si type: Al	eaf: 10, min_ub: {allow_m IKNN}}	_samples_split: 15, n_ inority: False, kind_se ADASYN	estimators: 69, l: all, n_neighb Over resampling	name: RF, rar pors: 2, smo_grp 0.978
1, min_sa dom_state UNDER, Random {classifier:	mples_le : 27}, so type: Al 29 : {boots	eaf: 10, min_ub: {allow_m IKNN}} RF trap: False,	_samples_split: 15, n_ inority: False, kind_se ADASYN class_weight: None, c	estimators: 69, l: all, n_neighb Over resampling riterion: gini,	name: RF, rar pors: 2, smo_grp 0.978 max_features:
1, min_sa dom_state UNDER, Random {classifier: min_samp	mples_lear: 27}, so type: Al 29 : {boots les_lear:	eaf: 10, min_ ub: {allow_m IKNN}} RF trap: False, 6	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c imples_split: 11, n_es	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144,	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar
1, min_sa dom_state UNDER, Random {classifier: min_samp dom_state	mples_les: 27}, setype: Al 29 : {boots les_leaf: 29}, :	eaf: 10, min_ ub: {allow_m IKNN}} RF trap: False, 6	_samples_split: 15, n_ inority: False, kind_se ADASYN class_weight: None, c	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144,	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar
1, min_sa dom_state UNDER, Random {classifier: min_samp dom_state ADASYN	mples_le: 27}, sitype: Al 29 : {boots les_leaf:: 29}, ::	eaf: 10, min_ub: {allow_m lKNN}} RF trap: False, 11, min_sa sub: {n_neig	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c imples_split: 11, n_es hbors: 7, random_stat	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144, ee: 29, smo_gr	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar p: OVER, type
1, min_sa dom_state UNDER, Random {classifier: min_samp dom_state ADASYN	mples_les: 27}, setype: Al 29 : {boots les_leaf: 29}, :	eaf: 10, min_ ub: {allow_m IKNN}} RF trap: False, 6	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c imples_split: 11, n_es	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144, e: 29, smo_gr Under	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar p: OVER, type
I, min_sa dom_state UNDER, Random {classifier: min_samp dom_state ADASYN Random	mples_les: 27}, sitype: Al 29 : {boots les_leaf:: 29}, :: }}	eaf: 10, min_ ub: {allow_m IKNN}} RF trap: False, 11, min_sa sub: {n_neigi	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c mples_split: 11, n_es hbors: 7, random_stat TomekLinks	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144, e: 29, smo_gr Under resampling	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar p: OVER, type 0.983
1, min_sa dom_state UNDER, 1 Random {classifier min_samp dom_state ADASYN Random {classifier	mples_lot: 27}, sit type: Al 29 : {boots les_leaf:: 29}, :: }} 36 :: {boots: {boots: }}	eaf: 10, min_ub: {allow_min_ub: {allow_min_kinn}} RF trap: False, 6: 11, min_sasub: {n_neig} RF trap: False, 6: 11, min_sasub: {n_neig}	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c imples_split: 11, n_esi hbors: 7, random_stat TomekLinks class_weight: balanced	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144, e: 29, smo_gr Under resampling l_subsample, c:	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar p: OVER, type 0.983 riterion: entropy
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1, min_sa dom_state UNDER, Random {classifier.msin_samp dom_state ADASYN Random {classifier.max_featu RF, random {classifier.auto, gammandom_st smo_grp; CleaningR Random {classifier.penalty_sc	mples_loss in ples_loss in ples	eaf: 10, min_ ab: {allow_m} liKNN}} RF trap: False, of trap:	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c mples_split: 11, n_es hbors: 7, random_stat TomekLinks class_weight: balanced leaf: 6, min_samples_sp mo_grp: UNDER, type Neighbourhood CleaningRule 8019, coef0: -0.607470 80063702, kernel: poly, lse, tol: 0.0518782404' leaning: 0.4060723697 OneSidedSelection 17383, 11_ratio: 0.31 dom_state: 59, tol:	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144, e: 29, smo_gr Under resampling _subsample, c olit: 11, n_estim:: TomekLinks} Under resampling _9498310942, d., name: SVM, p., 7026576}, sub: 0731564, type: Under resampling _5683476967366 0.021667728	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar p: OVER, type 0.983 riterion: entropy ators: 129, name } 0.980 egree: 3, gamma orobability: False {n_neighbors: 9} Neighbourhood 0.980 626, name: LF 3393548}, sul
1, min_sa dom_state UNDER, i Random {classifier. min_samp dom_state ADASYN Random {classifier. max_featu RF, random {classifier. auto, gamr random_st smo_grp: CleaningR Random {classifier. penalty_sc {n_neighb} OneSideds	mples_lo: 27}, sixtype: Al 29 : {boots les_leaf:: 29}, : {boots les_leaf:: 29}, : {boots les_leaf:: 39} : {boots les_leaf:: 39} : {boots les_leaf:: 29}, : {boots les_leaf:: 29}, : {C: 8.5 les_leaf:: 39} : {C: 8.5 les_leaf:: 39} UNDER tule} : {C: 8 boots les_leaf:: 39} UNDER tule} : {C: 8 boots les_leaf:: 39} UNDER tule} : {C: 8 boots les_leaf:: 39} INDER tule} Selection:: 44 boots les_leaf:: 44 boots leaf:: 44 boots les_leaf:: 44 boots leaf:: 44	eaf: 10, min_ ab: {allow_m} likNN}} RF trap: False, of trap:	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c mples_split: 11, n_es hbors: 7, random_stat TomekLinks class_weight: balanced leaf: 6, min_samples_sp mo_grp: UNDER, type Neighbourhood CleaningRule 8019, coef0: -0.607470 80063702, kernel: poly, lse, tol: 0.0518782404' leaning: 0.4060723697 OneSidedSelection 17383, 11_ratio: 0.31 dom_state: 59, tol: 18, random_state:	estimators: 69, 1: all, n_neighb Over resampling riterion: gini, timators: 144, e: 29, smo_gr Under resampling 1: subsample, c: olit: 11, n_estim 1: TomekLinks} Under resampling 9498310942, de 95983476967366 0021667728 59, smo_grp:	name: RF, rar pors: 2, smo_gr] 0.978 max_features: name: RF, rar p: OVER, type 0.983 riterion: entropy ators: 129, name } 0.980 egree: 3, gamma robability: False {n_neighbors: 5} Neighbourhood 0.980 526, name: LF 3393548}, sul UNDER, type
1, min_sa dom_state UNDER, i Random {classifier: min_samp dom_state ADASYN Random {classifier: max_featu RF, random } {classifier: max_featu RF, random } {classifier: grandom_st random_st smo_grp: CleaningR Random } {classifier: penalty_sc {n_neighb OneSided: Random }	mples_lo: 27}, sitype: Al 29 : {boots les_leaf:: 29}, : {boots les_leaf:: 29}, : {boots les_leaf:: 36} : {boots les_leaf:: 29}, : {C: 8.5 mm_state: 39} : {C: 8.5 mm_valu.ate: 39, UNDER tule}} 59 : {C: 8.5 lever: 1 lever	aef: 10, min_ab: {allow_mikNN}} RF trap: False, or 11, min_sa sub: {n_neig} RF trap: False, or 136}, sub: {sin_samples_136}, sub: {sin_samples_136}, sub: {sin_samples_14, threshold_c} LR LR 35.116217016 2+saga, ran, n_seeds_S: 1}} RF	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c mples_split: 11, n_es hbors: 7, random_stat TomekLinks class_weight: balanced leaf: 6, min_samples_sp mo_grp: UNDER, type Neighbourhood CleaningRule 8019, coef0: -0.607470 80063702, e-neol: poly, lse, tol: 0.0518782404' leaning: 0.4060723697 OneSidedSelection 17383, 11_ratio: 0.31 dom_state: 59, tol: 18, random_state: RepeatedEdited	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144, e: 29, smo_gr Under resampling l_subsample, colit: 11, n_estim l: TomekLinks} Under resampling 9498310942, d. name: SVM, p 7026576}, sub: 0731564, type: Under resampling 5683476967366 0.021667728 59, smo_grp: Under resampling	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar p: OVER, type 0.983 riterion: entrop; ators: 129, name; } 0.980 egree: 3, gamma- probability: False {n_neighbors: 9 Neighbourhood 0.980 626, name: LF 3393548}, sul UNDER, type 0.98
1, min_sa dom_state UNDER, 1 Random {classifier. min_samp dom_state ADASYN Random {classifier. max_featu RF, random {classifier. max_featu RF, random {classifier. auto, gamr random_st smo_grp: CleaningR Random {classifier. penalty_sc {n_neighb OneSided! Random {classifier.	mples_lo: 27}, sitype: Al 29 : {boots: boots: 29}, : {boots: 29}, : {boots: 1, nm_state: 39} : {C: 8.5 ma_valuate: 39, uNDER tale}} 59 : {C: 8 foots: 14 Selection 79 : {boots: 14 Selection 79} : {boots: 14 Selection 79}	aef: 10, min_ab: {allow_m} ab: {allow_m} klNN}} RF trap: False, ab: 11, min_sa sub: {n_neig} RF trap: False, ab: 136}, sub: {si} SVM 574929401348 ab: 5.0777038 shrinking: False, threshold_c LR 55.116217016 2+saga, ran n_seeds_S: 1}} RF	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c mples_split: 11, n_es hbors: 7, random_stat TomekLinks class_weight: balanced leaf: 6, min_samples_sp mo_grp: UNDER, type Neighbourhood CleaningRule 8019, coef0: -0.607470 80063702, kernel: poly, lse, tol: 0.0518782404' leaning: 0.4060723697 OneSidedSelection 17383, 11_ratio: 0.31 dom_state: 59, tol: 18, random_state: RepeatedEdited NearestNeighbours	estimators: 69, l: all, n_neighb Over resampling riterion: gini, timators: 144, e: 29, smo_gr Under resampling Lsubsample, c olit: 11, n_estim :: TomekLinks} Under resampling 9498310942, de, name: SVM, p 7026576}, sub: 0731564, type: Under resampling 5683476967366 0.021667728 59, smo_grp: Under resampling tunder resampling under resampling erion: entropy,	name: RF, rar pors: 2, smo_grp 0.978 max_features: name: RF, rar p: OVER, type 0.983 riterion: entropy ators: 129, name; } 0.980 egree: 3, gamma- orobability: False {n_neighbors: 9 Neighbourhood 0.980 626, name: LF 3393548}, sul UNDER, type 0.98 max_features:
I, min_sa dom_state UNDER, Random {classifier: min_samp dom_state ADASYN Random {classifier: max_featu RF, random {classifier: auto, gamr random_st smo_grp: CleaningR Random {classifier: penalty_sc {n_neighb} OneSidedS Random {classifier: min_samp	mples_lo: 27}, sixtype: Al 29 : {boots} : {boots} : {boots} : {boots} : {c: 8.5} May a loot	eaf: 10, min_ab: {allow_mikNN}} RF trap: False, or 11, min_samples_136}, sub: {sistem SVM} Trap: False, or 12, sub: {sistem SVM} Trap: False, or 13, sub: {sistem SVM} Trap: False, or 14, sub: {sistem SVM} Trap: False, or 15, sub: {sistem SVM} Trap: Trap: Trap: Trap: Trap: Trap: Trap: True, cl 1, min_samples_13, min_samples_14, min_samples_15, min_samples_15, min_samples_15, min_samples_16, min_samples_16	samples_split: 15, n_inority: False, kind_se ADASYN class_weight: None, c mples_split: 11, n_es hbors: 7, random_stat TomekLinks class_weight: balancectef: 6, min_samples_spmo_grp: UNDER, type Neighbourhood CleaningRule 8019, coef0: -0.607470 80063702, kernel: poly, lse, tol: 0.0518782404' leaning: 0.4060723697 OneSidedSelection 17383, 11_ratio: 0.31 ddom_state: 59, tol: 18, random_state: RepeatedEdited NearestNeighbours ass_weight: None, crit	estimators: 69, 1: all, n_neighb Over resampling riterion: gini, timators: 144, e: 29, smo_gr Under resampling 1: subsample, c: olit: 11, n_estim 1: TomekLinks} Under resampling 9498310942, de 9, name: SVM, p 7026576), sub: 0731564, type: Under resampling 5683476967366 0.021667728 59, smo_grp: Under resampling erion: entropy, ons: 83, name: F	name: RF, rar pors: 2, smo_gr] 0.978 max_features: name: RF, rar p: OVER, type 0.983 riterion: entropy ators: 129, name } 0.980 egree: 3, gamma- robability: False {n_neighbors: 5} Neighbourhood 0.980 526, name: LF 3393548}, sul UNDER, type 0.98 max_features: RF, random_statures: RF, random_statures:

continued on the next column

TABLE S-7 "WISCONSIN" – CONTINUED FROM PREVIOUS COLUMN

	WISCC	DNSIN – CC	ONTINUED FROM PREV.	IOUS COLUM	N
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	LR	AllKNN	Under	0.9786
(1 'C	(6	10.100012200	(7176 11 .: 0.05120	resampling	1.0
{classifier			667176, 11_ratio: 0.95128		
			random_state: 90, tol: 0. el: all, n_neighbors: 11, si		
1KNN}}	inority.	raise, kind_se	ci. an, n_neignoois. 11, si	mo_grp. CIVDI	Sic, type. 711-
Random	109	LR	EditedNearest	Under	0.9798
			Neighbours	resampling	
			48194, 11_ratio: 0.19713		
			om_state: 109, tol: 0.00		
TPE	9 an, n_n	RF	smo_grp: UNDER, type: E Neighbourhood	Under	0.982
IFE	"	I KI	CleaningRule	resampling	0.982
{classifier	: {boots	trap: True, c	class_weight: None, criter		nax_features:
			_samples_split: 10, n_e		
			eighbors: 8, smo_grp: U		old_cleaning:
			ighbourhoodCleaningRule		
TPE	18	RF	RandomUnderSampler	Under	0.9811
Lelaccifier	· /boots	tran: False (l class_weight: balanced, ci	resampling	nav features:
			_samples_split: 7, n_estim		
			state: 18, replacement: Fal		
RandomU			-	~·	• •
TPE	27	RF	SMOTEENN	Combine	0.9822
(1 'C	<u> </u>		1 11 1 1 1	resampling	
			class_weight: balanced_su		
			leaf: 11, min_samples_spli random_state: 27, smo_gr		
TEENN}}		27), 300. (rundom_state: 27, smo_gr	p. combite,	type. Sivio
TPE	29	RF	No	No	0.9811
			resampling	resampling	
		strap: False,			
			eaf: 14, min_samples_split	: 14, n_estimato	ors: 25, name:
TPE	m_state:	29}, sub: {si	mo_grp: NO, type: NO}} TomekLinks	Under	0.9832
IFE	30	I KI	TOTHERLITIKS	resampling	0.9632
{classifier	: {boots	trap: False, o	class_weight: balanced_su		rion: entropy,
			leaf: 8, min_samples_split		
	m_state:	36}, sub: {sr	mo_grp: UNDER, type: To	omekLinks}}	
TPE	39	LR	RepeatedEdited	Under	0.9809
{classifier	 : {C:	 	NearestNeighbours 179407, 11_ratio: 0.5617	resampling	name: LR,
nenalty so	. tC. olver no	one+saga rai	ndom_state: 39, tol: 0.0	0336897560394	
			smo_grp: UNDER, type: R		
bours}}				•	Č
TPE	59	RF	RandomOverSampler	Over	0.9811
(1 '0				resampling	
			class_weight: balanced_		
			eaf: 9, min_samples_split: indom_state: 59, smo_grp:		
Sampler}		57), 546. (14	andom_state. 55, smo_grp.	Overt, type. I	tundonno ver
TPE	79	LR	OneSidedSelection	Under	0.9809
				resampling	
			34689, 11_ratio: 0.55158		name: LR,
			random_state: 79, tol: 0		
edSelectio		n_seeds_S: 1	6, random_state: 79, smo_	grp: UNDER, t	ype: OneSid-
TPE	90	RF	TomekLinks	Under	0.9811
11.1.	'	131	TOHICKLIIKS	resampling	0.9011
{classifier	: {boot:	strap: False,	class_weight: balanced_		iterion: gini,
max_featu	ıres: 1, r	nin_samples_	leaf: 5, min_samples_split	: 6, n_estimato	
			no_grp: UNDER, type: To		
TPE	109	LR	AllKNN	Under	0.9809
(ala:£	[(C: 1	00.440962571	40402 11 ###:- 0.54244	resampling	mamar I D
{classifier			49492, 11_ratio: 0.54240, random_state: 109, tol:		
			nd_sel: all, n_neighbors: 1		
AllKNN}		.j, Ki		,g.p. 0	, ·JPc·

TABLE S-8 "PIMA" – CONTINUED FROM PREVIOUS COLUMN

Res.Group

GM

Resampler

Method | Seed | Classifier |

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	LR	SVMSMOTE	Over	0.7609
				resampling	
Grid	18	RF	SMOTEENN	Combine	0.7645
				resampling	
Grid	27	RF	RandomUnderSampler	Under	0.7671
				resampling	
Grid	29	RF	SMOTEENN	Combine	0.7655
				resampling	
Grid	36	RF	SMOTEENN	Combine	0.7655
				resampling	
Grid	39	RF	EditedNearest	Under	0.7534
			Neighbours	resampling	
Grid	59	RF	RandomUnderSampler	Under	0.7526
~			~	resampling	. = = =
Grid	79	RF	SMOTEENN	Combine	0.7539
G : 1	00	22	C) (OFFERNAL	resampling	0.765
Grid	90	RF	SMOTEENN	Combine	0.7657
C :: 1	100	I D	NMi	resampling	0.740
Grid	109	LR	NearMiss	Under	0.7495
Dond	0	DE	TomolyLinks	resampling	0.76
Random	9	RF	TomekLinks	Under	0.760
. 1	(1			resampling	
			lass_weight: balanced_sul		
			es_leaf: 16, min_samples_		
			b: {smo_grp: UNDER, typ		
Random	18	RF	ADASYN	Over	0.7635
				resampling	
			ss_weight: balanced, criter		
			les_split: 5, n_estimators:		
18}, sub:	{n neigh	bors: 9, rand	om_state: 18, smo_grp: O	VER, type: AD	ASYN}}
Random	27	RF	BorderlineSMOTE	Over	
Random	27	RF	BorderlineSMOTE	Over resampling	0.7715
	27	RF		Over resampling	0.7715
{classifier	27 : {boots	RF strap: True,	BorderlineSMOTE	Over resampling subsample, cr	0.771: iterion: gini
{classifier max_featu	27 : {boots	RF strap: True, t, min_sample	BorderlineSMOTE class_weight: balanced_	Over resampling subsample, cr split: 10, n_es	0.771: iterion: gini stimators: 50
{classifier max_featu name: RF	27 : {boots ares: sqrt , random	RF strap: True, t, min_sample _state: 27}, s	BorderlineSMOTE class_weight: balanced_es_leaf: 13, min_samples_	Over resampling subsample, cr split: 10, n_es borderline-1,	0.771: iterion: gini stimators: 50
{classifier max_featu name: RF 2, random	27 : {boots ares: sqrt , random	RF strap: True, t, min_sample _state: 27}, s	BorderlineSMOTE class_weight: balanced_ es_leaf: 13, min_samples_ ub: {k_neighbors: 3, kind:	Over resampling subsample, cr split: 10, n_es borderline-1,	0.7715 iterion: gini stimators: 50 m_neighbors
{classifier max_featu name: RF 2, random	: {boots ares: sqrt , random _state: 2	RF strap: True, t, min_sample _state: 27}, s 7, smo_grp: 0	BorderlineSMOTE class_weight: balanced_ ese_leaf: 13, min_samples_ ub: {k_neighbors: 3, kind: OVER, type: BorderlineSN	Over resampling subsample, cr split: 10, n_es borderline-1, MOTE}}	0.7715 iterion: gini stimators: 50 m_neighbors
{classifier max_featu name: RF 2, random Random	: {boots res: sqrt , random _state: 2	RF strap: True, s, min_sample _state: 27}, s 7, smo_grp: 0	BorderlineSMOTE class_weight: balanced_ ese_leaf: 13, min_samples_ ub: {k_neighbors: 3, kind: OVER, type: BorderlineSN	Over resampling subsample, cr split: 10, n_es borderline-1, MOTE}} Over resampling	0.7715 iterion: gini stimators: 50 m_neighbors 0.7666
{classifier max_featu name: RF, 2, random Random {classifier	: {boots res: sqrt, random _state: 2 29	RF strap: True, s, min_sample _state: 27}, s 7, smo_grp: 0 RF trap: True, c	BorderlineSMOTE class_weight: balanced_ es_leaf: 13, min_samples_ ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE BorderlineSMOTE	Over resampling subsample, cr split: 10, n_est split: 10, or split: 10,	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features
{classifier max_featu name: RF. 2, random Random {classifier log2, min	: {boots res: sqrt , random _state: 2 29 : {boots _sample:	RF strap: True, , min_sample _state: 27}, s 7, smo_grp: 0 RF trap: True, c s_leaf: 15, m	BorderlineSMOTE class_weight: balanced_ es_leaf: 13, min_samples, ub: {k_neighbors: 3, kind: OVER, type: BorderlineSM BorderlineSMOTE lass_weight: None, criter	Over resampling subsample, cr split: 10, n_es borderline-1, MOTE}} Over resampling ion: entropy, 1 estimators: 127	0.771: iterion: gini timators: 50 m_neighbors 0.7666 max_features 7, name: RF
{classifier max_featu name: RF 2, random Random {classifier log2, min random_st	: {boots res: sqrt random state: 2 29 : {boots sample tate: 29}	RF strap: True, , min_sample _state: 27}, s 7, smo_grp: 0 RF trap: True, c s_leaf: 15, n , sub: {k_nee	BorderlineSMOTE class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSM BorderlineSMOTE lass_weight: None, criter nin_samples_split: 14, n_ ighbors: 8, kind: borderli	Over resampling subsample, cr split: 10, n_es; borderline-1, 4OTE}} Over resampling ion: entropy, restimators: 12: nne-2, m_neigh	0.7715 iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF
{classifier max_featu name: RF, 2, random Random {classifier log2, min random_st dom_state	: {boots res: sqrt random state: 2 29 : {boots sample tate: 29}	RF strap: True, , min_sample _state: 27}, s 7, smo_grp: 0 RF trap: True, c s_leaf: 15, n , sub: {k_nee	BorderlineSMOTE class_weight: balanced_esc leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSM BorderlineSMOTE lass_weight: None, criter nin_samples_split: 14, n_ighbors: 8, kind: borderlin, type: BorderlineSMOTE	Over resampling subsample, cr split: 10, n_es; borderline-1, MOTE}} Over resampling ion: entropy, restimators: 12' nne-2, m_neigh}}	0.771: iterion: gini stimators: 50 m_neighbors 0.7660 nax_features 7, name: RF bors: 2, ran
{classifier max_featu name: RF, 2, random Random {classifier log2, min random_st dom_state	: {boots ress: sqrt, random state: 29 : {boots sample: tate: 29} : 29, sm	RF strap: True, c, smo_grp: 0 RF trap: True, c s_leaf: 15, n , sub: {k_ne o_grp: OVER	BorderlineSMOTE class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSM BorderlineSMOTE lass_weight: None, criter nin_samples_split: 14, n_ ighbors: 8, kind: borderli	Over resampling subsample, cr split: 10, n_es; borderline-1, 4OTE}} Over resampling ion: entropy, 1 estimators: 127: me-2, m_neigh}} Under	0.771: iterion: gini stimators: 50 m_neighbors 0.7660 nax_features 7, name: RF bors: 2, ran
{classifier max_featu name: RF, 2, random Random {classifier log2, min random_state Random	27 : {boots ures: sqrt, random _state: 2 29 : {boots _sample tate: 29} : 29, sm 36	RF strap: True, t, min_sample _state: 27), s 7, smo_grp: 6 RF trap: True, c s_leaf: 15, n , sub: {k_ne} o_grp: OVER	BorderlineSMOTE class_weight: balanced_ es_leaf: 13, min_samples_ ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE lass_weight: None, criter nin_samples_split: 14, n_ ighbors: 8, kind: borderlineSMOTE RandomUnderSampler	Over resampling subsample, cr split: 10, n_es borderline-1, MOTE}} Over resampling ion: entropy, 1 estimators: 12′ ne-2, m_neigh}} Under resampling	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF bors: 2, ran 0.7732
{classifier max_featu name: RF, 2, random Random {classifier log2, min random_st dom_state Random {classifier	27 : {boots ures: sqrt, random _state: 2 29 : {boots _sample tate: 29} : 29, sm 36 : {boots : {boots	RF strap: True, c, min_sample _state: 27], s 7, smo_grp: 0 RF trap: True, c s_leaf: 15, n , sub: {k_ne o_grp: OVER RF trap: True, c	BorderlineSMOTE class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE lass_weight: None, criter nin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE RandomUnderSampler lass_weight: balanced_sul	Over resampling substantial of the control of the c	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF bors: 2, ran 0.7732 ion: entropy
{classifier max_featt name: RF. 2, random Random {classifier log2, min random_state Random {classifier max_featt max_featt random_state random {classifier max_featt random_state random_state random {classifier max_featt random}	27 : {bootstres: sqrt, random state: 2} : {boots sample tate: 29}	RF strap: True, c, smo_grp: 0 RF trap: True, c s_leaf: 15, n , sub: {k_ne o_grp: OVER} RF trap: True, c s_leaf: 15, n , sub: True, c s_leaf: 15, n , sub: [k_ne o_grp: OVER] RF	BorderlineSMOTE class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSM BorderlineSMOTE lass_weight: None, criter nin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE RandomUnderSampler lass_weight: balanced_sulles_leaf: 8, min_samples,	Over resampling subsample, cr split: 10, n_es; borderline-1, 4OTE}} Over resampling ion: entropy, restimators: 12: ne-2, m_neigh}} Under resampling bample, criter_split: 2, n_es	0.771: iterion: gini stimators: 50 m_neighbors 0.7660 max_features , name: RF bors: 2, ran 0.773: ion: entropy timators: 73
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{classifier max_featt name: RF catt name: RF smo_grp: Random {classifier max_featt name: RF smo_	27 : {boots ures: sqrt random state: 29 : {boots sample: tate: 29}; : 29, sm 36 : {boots ures: log random type: Ra 39 : {boots ures: log random UNDER 59 : {boots ures: log random under random random random random random	RF strap: True, c, s, smo_grp: 0 RF trap: True, c s_leaf: 15, m, sub: {k_ne o_grp: OVER} RF trap: True, c c 2, min_samplo_state: 36}, s, ndomUnderSa RF trap: True, c c 2, min_samplo_state: 39}, s, type: OneSi RF trap: True, c c 2, min_samplo_state: 39}, s, type: True, c c 2, min_samplo_state: 59}, state: 59}, state: 59}, state: 59},	class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE lass_weight: None, criternin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE RandomUnderSampler lass_weight: balanced_sules_leaf: 8, min_samples_sub: {random_state: 36, reampler}} OneSidedSelection lass_weight: balanced_sules_leaf: 10, min_samples_ub: {n_neighbors: 8, n_sededSelection}} SMOTENC lass_weight: balanced_sules_leaf: 10, min_samples_ub: {n_neighbors: 8, n_sededSelection}} SMOTENC	Over resampling subsample, cr split: 10, n_es; borderline-1, MOTE}} Over resampling ion: entropy, 1 estimators: 127 me-2, m_neigh}} Under resampling baample, criter split: 2, n_es eplacement: Fa Under resampling baample, criter split: 17, n_est eds_S: 8, rand Over resampling baample, criter split: 17, n_est eds_S: 8, rand	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF bors: 2, ran 0.7732 ion: entropy timators: 73 lse, smo_grp 0.762 ion: entropy imators: 139 om_state: 39 0.7625 ion: entropy
{classifier max_featuname: RF-quiname: RF-	27 : {boots tress: sqrf, random _state: 2 29 : {boots _sample tate: 29} : {boots _sample tate: 29} : {boots _sample tate: 29} : {boots _ress: log _random type: Ra	RF strap: True, c, smo_grp: 6 RF trap: True, c, smo_grp: 6 trap: True, c, sub: {k_neo_grp: OVER RF trap: True, c, sub: {k_neo_grp: Neo_grp: OVER RF trap: True, c, sub: {k_neo_grp: Neo_grp: OVER RF trap: True, c, sub: {k_neo_grp: Neo_grp: Neo_grp: OVER RF trap: True, c, sub: {k_neo_grp: Neo_grp: Neo_grp: OVER RF trap: True, c, sub: {k_neo_grp: Neo_grp: Neo_grp	class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE lass_weight: None, criter_nin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE RandomUnderSampler lass_weight: balanced_sulutes_leaf: 8, min_samples_ub: {random_state: 36, reampler}} OneSidedSelection lass_weight: balanced_sulutes_leaf: 10, min_samples_ub: {n_neighbors: 8, n_sededSelection}} SMOTENC lass_weight: balanced_sulutes_leaf: 8, min_samples_ub: {categorical_features: sub: {categorical_features: sub: {categorical_features: sub: {categorical_features: st. type: SMOTENC}}	Over resampling subsample, cr split: 10, n_est borderline-1, MOTE} Over resampling ion: entropy, restimators: 12' sestimators: 2, m_neight 2, m_lestimators: 2, m_lestimators: 12' sestimators: 1	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF bors: 2, ran- ion: entropy timators: 73 see, smo_grp 0.762 ion: entropy imators: 139 om_state: 39 0.7625 ion: entropy imators: 139 om_state: 39
{classifier max_featt name: RF catt name: RF smo_grp: Random {classifier max_featt name: RF smo_	27 : {boots ures: sqrt random state: 29 : {boots sample: tate: 29}; : 29, sm 36 : {boots ures: log random type: Ra 39 : {boots ures: log random UNDER 59 : {boots ures: log random under random random random random random	RF strap: True, c, s, smo_grp: 0 RF trap: True, c s_leaf: 15, m, sub: {k_ne o_grp: OVER} RF trap: True, c c 2, min_samplo_state: 36}, s, ndomUnderSa RF trap: True, c c 2, min_samplo_state: 39}, s, type: OneSi RF trap: True, c c 2, min_samplo_state: 39}, s, type: True, c c 2, min_samplo_state: 59}, state: 59}, state: 59}, state: 59},	class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE lass_weight: None, criternin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE RandomUnderSampler lass_weight: balanced_sules_leaf: 8, min_samples_sub: {random_state: 36, reampler}} OneSidedSelection lass_weight: balanced_sules_leaf: 10, min_samples_ub: {n_neighbors: 8, n_sededSelection}} SMOTENC lass_weight: balanced_sules_leaf: 10, min_samples_ub: {n_neighbors: 8, n_sededSelection}} SMOTENC	Over resampling subsample, cr split: 10, n_es: borderline-1, 4OTE}} Over resampling ion: entropy, restimators: 12' ne-2, m_neigh}} Under resampling bample, criter split: 2, n_es: eplacement: Fa Under resampling bample, criter is split: 17, n_est eds_S: 8, rand Over resampling bample, criter split: 18, n_est True, k_neigh	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF bors: 2, ran 0.7732 ion: entropy timators: 73 lse, smo_grp 0.762: ion: entropy imators: 139 om_state: 39 0.762: ion: entropy
{classifier max_featurname: RF, 2, random Random {classifier log2, min random_state Random {classifier max_featurname: RF, UNDER, Random {classifier max_featurname: RF, smo_grp: Random {classifier max_featurname: RF, smo_grp: Random {classifier max_featurname: RF, andom {classifier max_featurname: RF, andom {classifier max_featurname: RF, andom state Random RANDOM RED RAN	27 : {boots random state: 29} : {boots sample tate: 29}: 29, sm 36 : {boots res: log sample tate: 29}: 29, sm 36 : {boots res: log sample tate: 29}: 29, sm 39 : {boots res: log sample tate: 29}; random type: Ra 39 : {boots res: log sample tate: 29}; random type: Ra 39 : {boots res: log sample tate: 29}; random type: 59; random type: 59 : {boots res: log sample tate: 29}; random type: 59; random	RF strap: True, c, smo_grp: 0 RF trap: True, c s_leaf: 15, m, sub: {k_ne o_grp: OVER} RF trap: True, c c 2, min_sample_state: 36}, shown dom/derSz RF trap: True, c c 2, min_sample_state: 39}, type: OneSi RF trap: True, c c 2, min_sample_state: 39}, shown dom/derSz RF trap: True, c c 2, min_sample_state: 39}, shown dom/derSz RF trap: True, c c 2, min_sample_state: 39}, c c c c c c c c c c c c c c c c c c c	class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE lass_weight: None, criternin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE RandomUnderSampler lass_weight: balanced_sules_leaf: 8, min_samples_sub: {random_state: 36, reampler}} OneSidedSelection class_weight: balanced_sules_leaf: 10, min_samples_sub: {random_state: 36, reampler}} SMOTENC class_weight: balanced_sules_leaf: 10, min_samples_sub: {n_neighbors: 8, n_seadedSelection}} SMOTENC class_weight: balanced_sules_leaf: 8, min_samples_sub: {categorical_features: 4, type: SMOTENC}} SMOTETOmek	Over resampling subsample, cr split: 10, n_es; borderline-1, MOTE}} Over resampling ion: entropy, 1 estimators: 12′ ne-2, m_neigh}} Under resampling bsample, criter split: 2, n_es eplacement: Fa Under resampling bsample, criter resampling bsample, criter split: 17, n_est eds_S: 8, rand Over resampling bsample, criter split: 17, n_est eds_S: 8, rand Over resampling bsample, criter split: 18, n_est True, k_neight Combine resampling	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF bors: 2, ran 0.7732 ion: entropy timators: 73 lse, smo_grp 0.762: ion: entropy imators: 139 om_state: 39 0.762: ion: entropy imators: 108 abors: 1, ran
{classifier max_feat than max_	27 : {boots random state: 29} : {boots sample tate: 29} : {boots sample tate: 29} : {boots sample tate: 29} : {boots res: log { fandom type: Ra a 39} : {boots res: log { fandom type: Random type: Random type: Random type: Random type: { fandom ty	RF strap: True, c, smo_grp: 6 RF trap: True, c s_leaf: 15, m, sub: {k_ne o_grp: OVER} RF trap: True, c c, s_leaf: 36, s_leaf: 36, s_leaf: 36, s_leaf: 39, s_l	class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE lass_weight: None, criter nin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE lass_weight: None, criter nin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE RandomUnderSampler lass_weight: balanced_sules_leaf: 8, min_samples, sub: {random_state: 36, reampler} OneSidedSelection lass_weight: balanced_sules_leaf: 10, min_samples_es_leaf: 10, min_samples_ub: {n_neighbors: 8, n_sededSelection}} SMOTENC lass_weight: balanced_sules_leaf: 8, min_samples_es_ub: {categorical_features: categorical_features: categorical_features	Over resampling subsample, cr split: 10, n_es: borderline-1, MOTE}} Over resampling ion: entropy, 1 estimators: 127: me-2, m_neigh}} Under resampling bample, criter split: 2, n_es eplacement: Fa Under resampling bample, criter split: 17, n_est eds_S: 8, rand Over resampling bample, criter split: 17, n_est eds_S: 8, rand Over resampling bample, criter split: 18, n_est True, k_neigh	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF bors: 2, ran 0.7732 ion: entropy timators: 73 lse, smo_grp 0.762: ion: entropy imators: 139 om_state: 39 0.762: ion: entropy imators: 108 abors: 1, ran 0.759:
{classifier max_featu ame: RF. 2, random ame: RF. 2, random_st dom_state Random state Random {classifier max_featu ame: RF. Random {classifier max_featu ame: RF. Random {classifier max_featu ame: RF. smo_grp: Random {classifier max_featu ame: RF. smo_grp: Random {classifier max_featu ame: RF. smo_grp: Random {classifier max_featu ame: RF. dom_state Random {classifier None, min. }	27 : {boots ures: sqrf, random _state: 2 29 : {boots _sample tate: 29} : {boots _sample tate: 29} : {boots _sample tate: 29} : {boots _res: log _random type: Ra	RF strap: True, c, min_sample_state: 27}, smo_grp: 0 RF trap: True, c s_leaf: 15, n , sub: {k_neo_grp: OVER RF trap: True, c c s_read; 15, n , sub: {k_neo_grp: OVER RF trap: True, c c c, min_sample_state: 36}, sndomUnderSa RF trap: True, c c c, min_sample_state: 39}, s , type: OneSi RF trap: True, c c c, min_sample_state: 59}, o_grp: OVER RF trap: True, c c s_leaf: 18, m	class_weight: balanced_es_leaf: 13, min_samples_ub: {k_neighbors: 3, kind: OVER, type: BorderlineSMOTE lass_weight: None, criternin_samples_split: 14, n_ighbors: 8, kind: borderlineSMOTE RandomUnderSampler lass_weight: balanced_sules_leaf: 8, min_samples_sub: {random_state: 36, reampler}} OneSidedSelection class_weight: balanced_sules_leaf: 10, min_samples_sub: {random_state: 36, reampler}} SMOTENC class_weight: balanced_sules_leaf: 10, min_samples_sub: {n_neighbors: 8, n_seadedSelection}} SMOTENC class_weight: balanced_sules_leaf: 8, min_samples_sub: {categorical_features: 4, type: SMOTENC}} SMOTETOmek	Over resampling subsample, cr split: 10, n_est borderline-1, MOTE}} Over resampling ion: entropy, restimators: 12' n_est mators: 13' n_est	0.771: iterion: gini stimators: 50 m_neighbors 0.7666 max_features 7, name: RF bors: 2, ran 0.773: ion: entropy imators: 139 om_state: 39 0.762: ion: entropy imators: 108 abors: 1, ran 0.759: max_features ame: RF, ran

TABLE S-8

"PIMA"

	90	RF	SMOTE	Over resampling	0.7648
{classifier	: {boots	tran: True.	class_weight: balanced_		terion: gini.
			es_leaf: 15, min_samples_		
			b: {k_neighbors: 1, randon		
type: SMC		- **	(= 0)		
Random	109	RF	CondensedNearest	Under	0.7615
			Neighbour	resampling	
{classifier	: {boots	rap: True, cl	ass_weight: None, criterio	on: gini, max_f	eatures: sqrt,
			mples_split: 7, n_estima		
			bors: 31, n_seeds_S: 37, r	andom_state: 1	09, smo_grp:
			estNeighbour}}		. ===
TPE	9	RF	RandomUnderSampler	Under	0.7728
Lelaccifier	· [bootet	ran: Falca, cle	Lass_weight: balanced, crite	resampling	nay faaturas:
			in_samples_split: 19, n_6		
			_state: 9, replacement: Tri		
RandomU					, , , ,
TPE	18	RF	ClusterCentroids	Under	0.7713
				resampling	
			ss_weight: balanced, crite		
			_samples_split: 16, n_esti		
			or: MiniBatchKMeans, ra	andom_state: 1	8, smo_grp:
			, voting: soft}}	TT4	0.7794
TPE	27	RF	ClusterCentroids	Under resampling	0.7784
{classifier	· {boots	tran: True c	lass_weight: None, criter		nax features:
			_samples_split: 16, n_esti		
			or: MiniBatchKMeans, ra		
			s, voting: soft}}		,g- _F .
TPE	29	LR	CondensedNearest	Under	0.7631
			Neighbour	resampling	
{classifier			-	2745559380061	· ·
			andom_state: 29, tol: 0.		
			15, random_state: 29,	smo_grp: UN	NDER, type:
		Neighbour}}	C) (OTET 1	0 1:	0.771
TPE	36	RF	SMOTETomek	Combine	0.771
				resampling	
{classifier	: {boots	trap: True, c	lass_weight: None, criter	resampling ion: entropy, n	nax_features:
{classifier sqrt, min_	: {boots	trap: True, c _leaf: 15, mir	 lass_weight: None, criter n_samples_split: 14, n_est	resampling ion: entropy, n imators: 85, na	nax_features: me: RF, ran-
{classifier sqrt, min_	: {boots	trap: True, c _leaf: 15, mir	lass_weight: None, criter	resampling ion: entropy, n imators: 85, na	nax_features: me: RF, ran-
{classifier sqrt, min_ dom_state	: {boots samples : 36}, su	trap: True, c _leaf: 15, mir b: {random_s	lass_weight: None, critern_samples_split: 14, n_est tate: 36, smo_grp: COMB	resampling ion: entropy, n imators: 85, na INE, type: SMO	nax_features: me: RF, ran- DTETomek}}
{classifier sqrt, min_dom_state} TPE {classifier	: {boots samples : 36}, su 39	trap: True, c _leaf: 15, mir b: {random_s RF rap: True, cla	lass_weight: None, critersamples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite	resampling ion: entropy, n imators: 85, na INE, type: SMO Over resampling rion: entropy, n	nax_features: me: RF, ran- DTETomek}} 0.7699 nax_features:
{classifier sqrt, min_ dom_state TPE {classifier sqrt, min_	: {boots samples : 36}, su 39 : {bootst samples	trap: True, c _leaf: 15, mir b: {random_s RF rap: True, cla _leaf: 17, mi	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE uss_weight: balanced, crite n_samples_split: 4, n_esti	resampling ion: entropy, n imators: 85, na INE, type: SMC Over resampling rion: entropy, n mators: 59, na	nax_features: me: RF, ran- DTETomek}} 0.7699 nax_features: me: RF, ran-
{classifier sqrt, min_ dom_state TPE {classifier sqrt, min_ dom_state	: {boots samples : 36}, su 39 : {bootst samples : 39}, s	trap: True, c _leaf: 15, mir b: {random_s RF rap: True, cla _leaf: 17, mi	lass_weight: None, critersamples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite	resampling ion: entropy, n imators: 85, na INE, type: SMC Over resampling rion: entropy, n mators: 59, na	nax_features: me: RF, ran- DTETomek}} 0.7699 nax_features: me: RF, ran-
{classifier sqrt, min_ dom_state TPE {classifier sqrt, min_ dom_state SMOTE}}	: {boots samples : 36}, su 39 : {bootst samples : 39}, s	trap: True, c _leaf: 15, mir b: {random_s RF rap: True, cla _leaf: 17, mir sub: {k_neigh	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite n_samples_split: 4, n_esti abors: 6, random_state: 2	resampling ion: entropy, n imators: 85, na INE, type: SMC Over resampling rion: entropy, n mators: 59, na 39, smo_grp: C	max_features: me: RF, ran- DTETomek}} 0.7699 max_features: me: RF, ran- DVER, type:
{classifier sqrt, min_ dom_state TPE {classifier sqrt, min_ dom_state	: {boots samples : 36}, su 39 : {bootst samples : 39}, s	trap: True, c _leaf: 15, mir b: {random_s RF rap: True, cla _leaf: 17, mi	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE uss_weight: balanced, crite n_samples_split: 4, n_esti	resampling ion: entropy, ri imators: 85, na INE, type: SMC Over resampling rion: entropy, ri mators: 59, nai 39, smo_grp: Over	nax_features: me: RF, ran- DTETomek}} 0.7699 nax_features: me: RF, ran-
{classifier sqrt, min_dom_state TPE {classifier sqrt, min_dom_state smOTE}}	: {boots samples : 36}, su 39 : {bootst samples : 39}, s	trap: True, c leaf: 15, mir b: {random_s RF rap: True, cla leaf: 17, mi ub: {k_neigh	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite n_samples_split: 4, n_est abors: 6, random_state: 3 RandomOverSampler	resampling ion: entropy, ri imators: 85, na INE, type: SMC Over resampling rion: entropy, ri mators: 59, nai 39, smo_grp: C Over resampling	max_features: me: RF, ran- DTETomek}} 0.7699 max_features: me: RF, ran- DVER, type: 0.7728
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{classifier sqrt, min_dom_state TPE {classifier sqrt, min_dom_state SMOTE}} TPE {classifier sqrt, min_random_st pler}} TPE {classifier None, mi random_st RandomUTPE {classifier none, mi random_st RandomUTPE {classifier log2, min_dom_state random_st random_st random_st random_st min_state random_st random_st min_dom_state random_st min_dom_state random_st min_dom_state random_state	: {boots; samples; : 36}, su 39 39 59 59 59 59 59 59 59 59 59 59 59 59 59	rap: True, c leaf: 15, mir Fr Frap: True, cla leaf: 17, mi rub: {k_neight RF rap: True, cla leaf: 11, m rub: {randon RF rap: True, cla leaf: 11, m rub: {randon RF rap: True, cla leaf: 7, n rap: True, cla sub: {randon RF rap: True, cla se_leaf: 7, n sub: {randon pler}} RF trap: True, c la sub: {randon pler} o leaf: 18, mi rap: True, c leaf: 18, mi rap: True, c leaf: 18, mi rap: True, c leaf: 18, mi	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite n_samples_split: 4, n_est abors: 6, random_state: 2 RandomOverSampler ss_weight: balanced, crite in_samples_split: 13, n_e n_state: 59, smo_grp: OVI RandomUnderSampler ss_weight: balanced, crite in_samples_split: 4, n_e n_state: 79, replacement: Tri SVMSMOTE lass_weight: None, criter n_samples_split: 6, n_est ins: 9, m_neighbors: 8, out ER, type: SVMSMOTE}}	resampling ion: entropy, n imators: 85, n instance: 85, n instance: 85, n instance: 85, n instance: 80, n instance: 90, n inst	max_features: me: RF, ran- DTETomek}} 0.7699 max_features: me: RF, ran- DVER, type: 0.7728 max_features: , name: RF, omOverSam- 0.7726 max_features: , name: RF, NDER, type: 0.7729 max_features: me: RF, ran- 7308616409,
{classifier sqrt, min_dom_state TPE {classifier sqrt, min_dom_state SMOTE}} TPE {classifier sqrt, min_random_st pler}} TPE {classifier None, min random_st RandomU TPE {classifier fog2, min_dom_state random_st TPE {classifier } }	: {boots; samples; : 36}, su 39 : {bootst samples; : 39}, s : {bootst samples; ate: 59} : {bootst n_samples; ate: 79}, nderSam 90 : {bootst samples; : 90}, su ate: 90, su ate: 90, in 109 : {bootst samples; : 90} : {bootst samples; : 90}, su ate: 90, su ate: 90, su ate: 90, in 109 : {bootst samples; : \$00} : {bootst samples; : 90} : {bootst samp	rap: True, c _leaf: 15, min b: {random_s} RF rap: True, cla _leaf: 17, min rub: {k_neigh} RF rap: True, cla _leaf: 11, min _sub: {randon} RF rap: True, cla _leaf: 7, nin _sub: {randon} RF rap: True, cla _leaf: 18, min b: {k_neigh} b: {k_neigh} RF trap: True, C	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite n_samples_split: 4, n_est iabors: 6, random_state: 3 RandomOverSampler ss_weight: balanced, crite in_samples_split: 13, n_c n_state: 59, smo_grp: OVI RandomUnderSampler ss_weight: balanced, crite in_samples_split: 4, n_e n_state: 79, replacement: To SVMSMOTE lass_weight: None, criter n_samples_split: 6, n_est ors: 9, m_neighbors: 8, out ER, type: SVMSMOTE} SMOTE class_weight: balanced_ class_weight: balanced_ class_weight: balanced_ class_weight: balanced_ class_weight: balanced_	resampling ion: entropy, resampling rion: entropy, resampling rion: entropy, restimators: 107 ER, type: Rand Under resampling rion: entropy, restimators: 142 resampling rion: entropy, restimators: 142 rue, smo_grp: U Over resampling rion: entropy, restimators: 142 rue, smo_grp: U Over resampling ion: entropy, restimators: 142 rue, smo_grp: U Over resampling ion: entropy, restimators: 80, na _step: 0.712788	max_features: me: RF, ran- DTETomek} 0.7699 max_features: me: RF, ran- DVER, type: 0.7728 max_features: , name: RF, omOverSam- 0.7726 max_features: , name: RF, NDER, type: 0.7729 max_features: me: RF, ran- 7308616409, 0.7659 terion: gini,
{classifier sqrt, min_dom_state TPE {classifier sqrt, min_dom_state SMOTE}} TPE {classifier sqrt, min_random_st pler}} TPE {classifier None, mirandom_st RandomU TPE {classifier sqrt, min_random_st sqrt, min_random_st sqrt, min_random_st sqrt, min_random_st sqrt, min_random_st sqrt, min_random_st sqrt, min_dom_state random_st sqrt, sqr	: {boots; samples; : 36}, su 39	rap: True, c _leaf: 15, min b: {random_s} RF rap: True, cla _leaf: 17, min rub: {k_neighter RF rap: True, cla _leaf: 11, min rub: {randon} RF rap: True, cla _leaf: 7, nin rap: True, cla _leaf: 18, min rap: True, cla sub: {randon} RF rap: True, cla sub: {randon}	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite n_samples_split: 4, n_est abors: 6, random_state: 2 RandomOverSampler ss_weight: balanced, crite in_samples_split: 13, n_e n_state: 59, smo_grp: OVI RandomUnderSampler ss_weight: balanced, crite in_samples_split: 4, n_e n_state: 79, replacement: The SVMSMOTE lass_weight: None, criter n_samples_split: 6, n_est ors: 9, m_neighbors: 8, out ER, type: SVMSMOTE} SMOTE class_weight: balanced_ses_leaf: 11, min_samples_ splesf: 11, min_samples_ sleaf: 11, min_samples_	resampling ion: entropy, n imators: 85, n iNE, type: SMC Over resampling rion: entropy, n mators: 59, n mators: 59, n mators: 107 ER, type: Rande Under resampling rion: entropy, n estimators: 142 rue, smo_grp: U Over resampling rion: entropy, n estimators: 142 rue, smo_grp: U Over resampling ion: entropy, n estimators: 142 rue, smo_grp: U Over resampling ion: entropy, n estimators: 80, n a_step: 0.712788 Over resampling subsample, cri split: 9, n_esti	max_features: me: RF, ran- DTETomek} 0.7699 max_features: me: RF, ran- DVER, type: 0.7728 max_features: , name: RF, omOverSam- 0.7726 max_features: , name: RF, NDER, type: 0.7729 max_features: me: RF, ran- 7308616409, 0.7659 terion: gini, mators: 144,
{classifier sqrt, min_dom_state TPE {classifier sqrt, min_dom_state SMOTE}} TPE {classifier sqrt, min_random_st pler}} TPE {classifier None, mi random_st RandomUTPE {classifier log2, min_dom_state random_st TPE {classifier max_featuname: RF	: {boots; samples; : 36}, su 39 : {boots; samples; : 39}, s : {bootst samples; : 39}, s : {bootst samples; : 29}, su : {bootst samples; : 29}, su : {bootst samples; : 29}, su : {bootst samples; : 290}, randon	rrap: True, c leaf: 15, min b: {random_s} RF rap: True, cla leaf: 17, min rub: {k_neight rap: True, cla leaf: 11, min rap: True, cla leaf: 18, min leaf: 19, min leaf: 10, min leaf: 11, min leaf:	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite n_samples_split: 4, n_est iabors: 6, random_state: 3 RandomOverSampler ss_weight: balanced, crite in_samples_split: 13, n_c n_state: 59, smo_grp: OVI RandomUnderSampler ss_weight: balanced, crite in_samples_split: 4, n_e n_state: 79, replacement: To SVMSMOTE lass_weight: None, criter n_samples_split: 6, n_est ors: 9, m_neighbors: 8, out ER, type: SVMSMOTE} SMOTE class_weight: balanced_ class_weight: balanced_ class_weight: balanced_ class_weight: balanced_ class_weight: balanced_	resampling ion: entropy, n imators: 85, n iNE, type: SMC Over resampling rion: entropy, n mators: 59, n mators: 59, n mators: 107 ER, type: Rande Under resampling rion: entropy, n estimators: 142 rue, smo_grp: U Over resampling rion: entropy, n estimators: 142 rue, smo_grp: U Over resampling ion: entropy, n estimators: 142 rue, smo_grp: U Over resampling ion: entropy, n estimators: 80, n a_step: 0.712788 Over resampling subsample, cri split: 9, n_esti	max_features: me: RF, ran- DTETomek} 0.7699 max_features: me: RF, ran- DVER, type: 0.7728 max_features: , name: RF, omOverSam- 0.7726 max_features: , name: RF, NDER, type: 0.7729 max_features: me: RF, ran- 7308616409, 0.7659 terion: gini, mators: 144,
{classifier sqrt, min_dom_state TPE {classifier sqrt, min_dom_state SMOTE}} TPE {classifier sqrt, min_random_st pler}} TPE {classifier None, mirandom_st RandomU TPE {classifier sqrt, min_random_st sqrt, min_random_st sqrt, min_random_st sqrt, min_random_st sqrt, min_random_st sqrt, min_random_st sqrt, min_dom_state random_st sqrt, sqr	: {boots; samples; : 36}, su 39 : {boots; samples; : 39}, s : {bootst samples; : 39}, s : {bootst samples; : 29}, su : {bootst samples; : 29}, su : {bootst samples; : 29}, su : {bootst samples; : 290}, randon	rrap: True, c leaf: 15, min b: {random_s} RF rap: True, cla leaf: 17, min rub: {k_neight rap: True, cla leaf: 11, min rap: True, cla leaf: 18, min leaf: 19, min leaf: 10, min leaf: 11, min leaf:	lass_weight: None, criter n_samples_split: 14, n_est tate: 36, smo_grp: COMB SMOTE ss_weight: balanced, crite n_samples_split: 4, n_est abors: 6, random_state: 2 RandomOverSampler ss_weight: balanced, crite in_samples_split: 13, n_e n_state: 59, smo_grp: OVI RandomUnderSampler ss_weight: balanced, crite in_samples_split: 4, n_e n_state: 79, replacement: The SVMSMOTE lass_weight: None, criter n_samples_split: 6, n_est ors: 9, m_neighbors: 8, out ER, type: SVMSMOTE} SMOTE class_weight: balanced_ses_leaf: 11, min_samples_ splesf: 11, min_samples_ sleaf: 11, min_samples_	resampling ion: entropy, n imators: 85, n iNE, type: SMC Over resampling rion: entropy, n mators: 59, n mators: 59, n mators: 107 ER, type: Rande Under resampling rion: entropy, n estimators: 142 rue, smo_grp: U Over resampling rion: entropy, n estimators: 142 rue, smo_grp: U Over resampling ion: entropy, n estimators: 142 rue, smo_grp: U Over resampling ion: entropy, n estimators: 80, n a_step: 0.712788 Over resampling subsample, cri split: 9, n_esti	max_features: me: RF, ran- DTETomek} 0.7699 max_features: me: RF, ran- DVER, type: 0.7728 max_features: , name: RF, omOverSam- 0.7726 max_features: , name: RF, NDER, type: 0.7729 max_features: me: RF, ran- 7308616409, 0.7659 terion: gini, mators: 144,

TABLE S-9 "IRISO" – CONTINUED FROM PREVIOUS COLUMN

TABLE S-9 "IRISO"

Grid 9	Method	Seea	Classiner	Kesampier	Kes.Group	GM
Grid	Grid	9	SVM			1.0
Grid 27 SVM No No No 1.0						
Grid 29 SVM No resampling resamp	Grid	18	SVM	No	No	1.0
Grid 29 SVM No				resampling	resampling	
Grid 29 SVM No resampling resamp	Grid	27	SVM	No	No	1.0
Grid 36 SVM No				resampling	resampling	
Grid 39 SVM No resampling Resamp	Grid	29	SVM	No	No	1.0
Grid 39 SVM No resampling Resamp				resampling	resampling	
Grid 39 SVM	Grid	36	SVM	No	No	1.0
Grid 39 SVM				resampling	resampling	
Grid	Grid	39	SVM			1.0
Grid 59 SVM No resampling resampling 1.0 resampling						
Grid 79 SVM No No No 1.0	Grid	59	SVM			1.0
Grid	Ond		5 1112			110
Grid 90 SVM No No No 1.0 resampling lounder 1.0 resampling lounder support of the property of the pro	Grid	79	SVM			1.0
Grid 90 SVM No resampling resampling Grid 109 SVM No No No 1.0 Random 9 RF ClusterCentroids Under resampling Random 9 RF ClusterCentroids Under resampling {classifier: {bootstrap: True, class_weight: None, criterion: entropy, max_features: sqrt, min_samples_leaf: 18, min_samples_split: 13, n_estimators: 82, name: RF, random_state: 9}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} Random 18 DT EditedNearest Under Neighbours resampling {classifier: {criterion: entropy, max_depth: 5, max_features: None, min_samples_leaf: 14, min_samples_split: 7, name: DTC, random_state: 18}, sub: {kind_sel: all, n_neighbors: 7, smo_grp: UNDER, type: EditedNearestNeighbours}} Random 27 LR BorderlineSMOTE Over 1.0 {classifier: {C: 9.529652080962741, 11_ratio: 0.8594259123848675, name: LR, penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random 29 DT SMOTETomek Combine 1.0 resampling {classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29, smo_grp: COMBINE, type: SMOTETomek}} Random 36 LR RepeatedEdited Under 1.0 RearestNeighbours 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over 1.0 resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39}, su	Giid	' '	5 7 171			1.0
Grid 109 SVM No No No 1.0 resampling re	Grid	90	SVM			1.0
Grid 109 SVM No resampling No resampling Random 9 RF ClusterCentroids Under resampling Clussifier: {bootstrap: True, class_weight: None, criterion: entropy, max_features: sqrt, min_samples_leaf: 18, min_samples_split: 13, n_estimators: 82, name: RF, random_state: 9}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} Random 18 DT EditedNearest Under resampling Classifier: {criterion: entropy, max_depth: 5, max_features: None, min_samples_leaf: 14, min_samples_split: 7, name: DTC, random_state: 18], sub: {kind_sel: all, n_neighbors: 7, smo_grp: UNDER, type: EditedNearestNeighbours}} Random 27 LR BorderlineSMOTE Over 1.0 resampling Classifier: {C: 9.529652080962741, 11_ratio: 0.8594259123848675, name: LR, penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k, neighbors: 2, kind_ borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random 29 DT SMOTETomek Combine resampling Classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29, smo_grp: COMBINE, type: SMOTETomek} Combine resampling Classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours} Random 39 RF SMOTE Over 1.0 resampling Classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 5, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39}, sub: {k_neighbors: 4, random_state: 39}, sub: {k_neighbors: 4, random_state: 39}, sub: {k_neighbors: 7, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7,	Gild	70	S V IVI			1.0
Random 9 RF	Caid	100	CVM			1.0
Random 9 RF	Giid	109	S V IVI			1.0
classifier: {bootstrap: True, class_weight: None, criterion: entropy, max_features: sqrt, min_samples_leaf: 18, min_samples_plit: 13, n_estimators: 82, name: RF, random_state: 9}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} Random 18		_	D.F.			1.0
Classifier: {bootstrap: True, class_weight: None, criterion: entropy, max_features: sqrt, min_samples_leaf: 18, min_samples_split: 13, n_estimators: 82, name: RF, random_state: 9}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} Random	Random	9	KF	ClusterCentroids	1	1.0
sqrt, min_samples_leaf: 18, min_samples_split: 13, n_estimators: 82, name: RF, random_state: 9}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} Random						
dom_state: 9}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} Random 18						
ClusterCentroids, voting: hard} Random 18	sqrt, min_	_samples	_leaf: 18, mi	n_samples_split: 13, n	_estimators: 82	2, name: RF, ran-
Random 18	dom_state	: 9}, su	b: {estimator:	: KMeans, random_sta	ate: 9, smo_grp	: UNDER, type:
Neighbours resampling	ClusterCe	ntroids,	voting: hard}	}		
{classifier: {criterion: entropy, max_depth: 5, max_features: None, min_samples_leaf: 14, min_samples_split: 7, name: DTC, random_state: 18}, sub: {kind_sel: all, n_neighbors: 7, smo_grp: UNDER, type: EditedNearestNeighbours}} Random 27 LR BorderlineSMOTE Over resampling {classifier: {C: 9.529652080962741, 11_ratio: 0.8594259123848675, name: LR, penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random 29 DT SMOTETomek Combine resampling {classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29, smo_grp: COMBINE, type: SMOTETomek}} Random 36 LR RepeatedEdited Under resampling 1.0 resampling {classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTENC}} Random 59 RF SMOTENC Over	Random	18	DT	EditedNearest	Under	1.0
{classifier: {criterion: entropy, max_depth: 5, max_features: None, min_samples_leaf: 14, min_samples_split: 7, name: DTC, random_state: 18}, sub: {kind_sel: all, n_neighbors: 7, smo_grp: UNDER, type: EditedNearestNeighbours}} Random 27 LR BorderlineSMOTE Over resampling {classifier: {C: 9.529652080962741, 11_ratio: 0.8594259123848675, name: LR, penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random 29 DT SMOTETomek Combine resampling {classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29, smo_grp: COMBINE, type: SMOTETomek}} Random 36 LR RepeatedEdited Under resampling 1.0 resampling {classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTENC}} Random 59 RF SMOTENC Over				Neighbours	resampling	
14, min_samples_split: 7, name: DTC, random_state: 18}, sub: {kind_sel: all, n_neighbors: 7, smo_grp: UNDER, type: EditedNearestNeighbours}} Random 27 LR BorderlineSMOTE Over nesampling {classifier: {C: 9.529652080962741, 11_ratio: 0.8594259123848675, name: LR, penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random 29 DT SMOTETomek Combine resampling {classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29, smo_grp: COMBINE, type: SMOTETomek}} Random 36 LR RepeatedEdited NearestNeighbours Under resampling {classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTENC Over resampling {classifier: {bootstrap: False, class_weight: balanced, criterion	{classifier	: {criteri	on: entropy, i			nin samples leaf:
n_neighbors: 7, smo_grp: UNDER, type: EditedNearestNeighbours} Random 27 LR BorderlineSMOTE Over resampling 1.0 {classifier: {C: 9.529652080962741, 11_ratio: 0.8594259123848675, name: LR, penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random 29 DT SMOTETomek Combine resampling 1.0 {classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29}, smo_grp: COMBINE, type: SMOTETomek} Under resampling {classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Under resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTEN} 1.0 Random 59 RF SMOTENC Over resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59}, smo_grp: OVER, type: SM						
Random 27						
classifier: {C: 9.529652080962741, 11_ratio: 0.8594259123848675, name: LR, penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random 29 DT SMOTETomek Combine resampling Classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29, smo_grp: COMBINE, type: SMOTETomek}} Random 36 LR RepeatedEdited Under 1.0 NearestNeighbours resampling Classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over 1.0 resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTE}} Random 59 RF SMOTENC Over 1.0 resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under resampling {classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors.ver3: 16, smo_grp: UNDER, type: NearMiss, version:						
{classifier: {C: 9.529652080962741, 11_ratio: 0.8594259123848675, name: LR, penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random 29 DT SMOTETomek Combine resampling {classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29, smo_grp: COMBINE, type: SMOTETomek}} Random 36 LR RepeatedEdited NearestNeighbours resampling Under resampling {classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTEN} Random 59 RF SMOTENC Over resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER,	Kandom	21	LK	BolderiniesWOTE		1.0
penalty_solver: elasticnet+saga, random_state: 27, tol: 0.003906565798961128}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} Random	(1 :0	(C)	2.5206520000	(2741 11 : 0.0		(75
{k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} 29 DT SMOTETomek Combine resampling 1.0 Random 29 DT SMOTETomek Combine resampling 1.0 {classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29, smo_grp: COMBINE, type: SMOTETomek}} Random 36 LR RepeatedEdited NearestNeighbours resampling Under resampling {classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over 1.0 Over resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTEN} Random 59 RF SMOTENC Over resampling 1.0 {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59}, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under resampling 1.0 {classifier: {c: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 7						
OVER, type: BorderlineSMOTE}						
Random 29 DT SMOTETomek Combine resampling					4, random_stat	te: 27, smo_grp:
		-				
{classifier: {criterion: gini, max_depth: 10, max_features: 1, min_samples_leaf: 7, min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29}, Random 36 LR RepeatedEdited NearestNeighbours Under resampling 1.0 {classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sell, sub: kind_sell, sub:	Random	29	DT	SMOTETomek		1.0
min_samples_split: 15, name: DTC, random_state: 29}, sub: {random_state: 29}, smo_grp: COMBINE, type: SMOTETomek}} Random						
Smo_grp: COMBINE, type: SMOTETomek} Random 36	{classifier	: {criter	ion: gini, ma	ax_depth: 10, max_fea	atures: 1, min_	_samples_leaf: 7,
Random 36	min_samp	oles_split	: 15, name:	DTC, random_state:	29}, sub: {ra	andom_state: 29,
NearestNeighbours resampling	smo_grp:	COMBI	NE, type: SM	IOTETomek}}		
NearestNeighbours resampling	Random	36	LR	RepeatedEdited	Under	1.0
{classifier: {C: 25.290684716908764, 11_ratio: 0.7521550903778699, name: LR, penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTEN} Random 59 RF SMOTENC Over resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under resampling {classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:					1	
penalty_solver: 12+sag, random_state: 36, tol: 0.08351112042635321}, sub: {kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random	{classifier	. {C· 2	5 290684716	908764 11 ratio: 0.7	521550903778	699 name: LR
all, n_neighbors: 16, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} Random 39 RF SMOTE Over 1.0 resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTE}} Random 59 RF SMOTENC Over 1.0 resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under 1.0 resampling {classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:						
Random 39 RF SMOTE Over resampling Classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTE} Random 59 RF SMOTENC Over resampling Classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under resampling Classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:						
resampling						
{classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTE}} Random 59 RF SMOTENC Over resampling 1.0 resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under resampling {classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:	Kandom	39	KF	SMOTE	1	1.0
max_features: 1, min_samples_leaf: 2, min_samples_split: 15, n_estimators: 126, name: RF, random_state: 39}, sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTE}} Random	(1 :0	(1)				
RF, random_state: 39], sub: {k_neighbors: 4, random_state: 39, smo_grp: OVER, type: SMOTE}} Random						
SMOTE Random 59 RF SMOTENC Over resampling (classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59 , sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC} Random 79 SVM NearMiss Under resampling (classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:						
Random 59 RF SMOTENC Over resampling [classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under resampling	RF, rando	m_state:	39}, sub: {k_	_neighbors: 4, random_	state: 39, smo_	grp: OVER, type:
resampling	SMOTE)	}				
resampling	Random	59	RF	SMOTENC	Over	1.0
{classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under 1.0 resampling {classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:					resampling	
None, min_samples_leaf: 16, min_samples_split: 5, n_estimators: 149, name: RF, random_state: 59 , sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79	{classifier	· {boots	tran: False o	class weight balanced	criterion: gir	ni max features:
random_state: 59}, sub: {categorical_features: True, k_neighbors: 7, random_state: 59, smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under resampling 1.0 resampling {classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979], sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:	None mi	n samnl	es leaf: 16	min samples split: 5	n estimators:	149 name: RF
smo_grp: OVER, type: SMOTENC}} Random 79 SVM NearMiss Under resampling 1.0 {classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:						
Random 79 SVM NearMiss Under resampling 1.0 {classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:					_neignoors. /, i	anuom_state. 39,
resampling					T T T	
{classifier: {C: 145.43923105808813, coef0: -0.028436683097273097, degree: 3, gamma: value, gamma_value: 0.9006163514445386, kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979}, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:	Kandom	79	SVM	NearMiss	1	1.0
gamma: value, gamma_value: 0.9006163514445386 , kernel: poly, name: SVM, probability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979 }, sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:			L			
ability: True, random_state: 79, shrinking: False, tol: 0.008889748156938979), sub: {n_neighbors: 11, n_neighbors_ver3: 16, smo_grp: UNDER, type: NearMiss, version:						
$ \{n_neighbors: 11, n_neighbors_ver 3: 16, smo_grp: UNDER, type: NearMiss, version: 100 type \} $	gamma: v	alue, gai	mma_value: (0.9006163514445386, 1	kernel: poly, na	ame: SVM, prob-
$ \{n_neighbors: 11, n_neighbors_ver 3: 16, smo_grp: UNDER, type: NearMiss, version: 11, n_neighbors_ver 3: 12, smo_grp: UNDER, type: NearMiss, version: 11, smo_grp: UNDER, type: NearMiss, type: $	ability: Tr	rue, rand	lom_state: 79	, shrinking: False, tol:	: 0.0088897481	156938979}, sub:
	1}}	,			, -, F 2 . 1 .	,

continued on the next column

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	RepeatedEdited	Under	1.0
[classifier:	[boots	tran: True o	NearestNeighbours class_weight: balanced	resampling	ritarion: antrony
			es_leaf: 18, min_samp		
			, sub: {kind_sel: mo		
			NearestNeighbours}}	, – 0	,
Random	109	SVM	EditedNearest	Under	1.0
(alassifiam	(C. 25	1041604426	Neighbours 9927, coef0: 0.713103	resampling	
			79328954, kernel: poly.		
			False, tol: 0.05812008		
			ER, type: EditedNeare	estNeighbours}}	
TPE	9	RF	ClusterCentroids	Under	1.0
[alossifian	(boots	tron: True a	lass_weight: None, c	resampling	y may faaturas:
			n_samples_split: 13, n		
			: KMeans, random_sta		
		voting: hard}			, , , , , , , , , , , , , , , , , , , ,
TPE	18	DT	EditedNearest	Under	1.0
			Neighbours	resampling	
			max_depth: 5, max_fea		
			me: DTC, random_st ER, type: EditedNeare		
	27	LR	BorderlineSMOTE	Over	1.0
				resampling	
			62741, 11_ratio: 0.8		
			random_state: 27, tol		
			line-2, m_neighbors:	4, random_stat	e: 27, smo_grp:
	29	lerlineSMOTE DT	SMOTETomek	Combine	1.0
11.6	29		SWOTETOILER	resampling	1.0
{classifier:	{criter	ion: gini, ma	x_depth: 10, max_fea		samples_leaf: 7,
			DTC, random_state:		
			IOTETomek}}		
TPE	36	LR	RepeatedEdited	Under	1.0
[classifier:	(C) 2	 	NearestNeighbours 908764, 11_ratio: 0.7	resampling	600 name: I D
			state: 36, tol: 0.08351		
			UNDER, type: Repeat		
TPE	39	RF	SMOTE	Over	1.0
				resampling	
			class_weight: balanced		
_			eaf: 2, min_samples_sp		
SMOTE}}	_state.	39}, sub. {K_	_neighbors: 4, random_	state. 39, sino_	gip. Ovek, type.
	59	RF	SMOTENC	Over	1.0
				resampling	
			class_weight: balanced		
			min_samples_split: 5,		
			orical_features: True, k	_neignbors: /, r	andom_state: 59,
TPE	79	type: SMOTE SVM	NearMiss	Under	1.0
11.2	1)	SVM	1 (Cariviiss	resampling	1.0
{classifier:	{C: 1	45.43923105	808813, coef0: -0.02	8436683097273	3097, degree: 3,
			0.9006163514445386, 1		
			, shrinking: False, tol:		
	rs: 11,	n_neighbors_	ver3: 16, smo_grp: Ul	NDER, type: N	earMiss, version:
1}} TPE	90	RF	RepeatedEdited	Under	1.0
1112	<i>9</i> 0	KI	NearestNeighbours	resampling	1.0
{classifier:	{boots	trap: True, c	class_weight: balanced		riterion: entropy,
max_feature	es: sqrt	t, min_sample	es_leaf: 18, min_samp	oles_split: 9, n	_estimators: 135,
			, sub: {kind_sel: mo	de, n_neighbor	rs: 13, smo_grp:
	•		NearestNeighbours}}		
TPE	109	SVM	EditedNearest	Under	1.0
I .			Neighbours	resampling	
{classifier	{C: 35	1941694426	9927_coef0+ 0.713103	3618700079 de	oree, 1 gamma,
			9927, coef0: 0.713103 79328954, kernel: poly.		
auto, gamm	a_valu	e: 5.87651887	9927, coef0: 0.713103 79328954, kernel: poly False, tol: 0.05812008	, name: SVM, p	probability: False,

TABLE S-10 "GLASSO"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	RF	No	No	0.87
Grid	18	RF	resampling CondensedNearest	resampling Under	0.8859
Gild	10	KI	Neighbour	resampling	0.8839
Grid	27	RF	SMOTENC	Over	0.8717
	20	DE.	CV TV COV COTTE	resampling	0.000
Grid	29	RF	SVMSMOTE	Over resampling	0.8606
Grid	36	RF	SMOTENC	Over	0.8745
				resampling	
Grid	39	RF	CondensedNearest	Under	0.8728
Grid	59	RF	Neighbour SMOTE	resampling Over	0.8752
0.14	"		5012	resampling	0.0702
Grid	79	RF	SMOTENC	Over	0.8723
Grid	90	RF	SMOTENC	Over Over	0.8673
Gild	90	KI	SWOTENC	resampling	0.8073
Grid	109	RF	SMOTE	Over	0.8681
D 1		DE	CVAVCMOTE	resampling	0.0574
Random	9	RF	SVMSMOTE	Over resampling	0.8574
{classifier	: {boots	trap: False, o	class_weight: balanced		riterion: entropy,
			les_leaf: 6, min_sam		
			sub: {k_neighbors:		
0.7099634 Random	18	RF	state: 9, smo_grp: OV. SMOTENC	Over	0.8498
Kandom	10	KI	SWOTENC	resampling	0.6496
{classifier	: {boots	trap: True, c	lass_weight: balanced		ni, max_features:
			samples_split: 12, n_o		
			cal_features: True, k_	neighbors: 6, r	andom_state: 18,
Random	27	type: SMOTE RF	SMOTENC	Over	0.8643
Rundom	-	Tu	SMOTERE	resampling	0.0015
			ss_weight: balanced,		
			n_samples_split: 6, n_		
		type: SMOTE	cal_features: True, k_ NC}}	neighbors: 8, 1	andom_state: 27,
Random	29	RF	SMOTE	Over	0.8513
				resampling	
			class_weight: None, c		
			n_samples_split: 18, n nbors: 9, random_stat		
SMOTE}		ouo. (k_neigi	ibors. 9, random_sta	.c. 25, 5mo_gr	p. Over, type.
Random	36	RF	KMeansSMOTE	Over	0.8613
(-1:6	. (1	T1-		resampling	
			samples_split: 15, n_e		
			palance_threshold: 0.20		
	_state: 3	6, smo_grp:	OVER, type: KMeans	SMOTE}}	
Random	39	RF	No 1:	No	0.846
{claccifiar	· {boote	tran: Falce /	resampling class_weight: None, c	resampling	w max features
			_samples_split: 17, n		
dom_state	: 39}, st	ib: {smo_grp:	NO, type: NO}}		
Random	59	RF	SMOTENC	Over	0.8667
(classifier	· (boot	etrop: True	class waight: bolons	resampling	criterion: cir:
			class_weight: balanc leaf: 1, min_samples_s		
			tegorical_features: Tru		
59, smo_g	grp: OVE	ER, type: SM	OTENC}}		
Random	79	DT	OneSidedSelection	Under	0.86
{classifier	· {criter	ion gini ma	 x_depth: 15, max_fe	resampling	in samples leaf
			ne: DTC, random_sta		
			9, smo_grp: UNDER,		
	-	·	Co	ontinued on t	he next column

TABLE S-10
"GLASSO" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	SVMSMOTE	Over	0.8667
{classifier	: {boots	tran: False. o	 class_weight: balanced_s	resampling ubsample, crite	erion: entropy.
			oles_leaf: 6, min_sample		
name: RI	rando	m_state: 90}	, sub: {k_neighbors: 2,	m_neighbors:	8, out_step:
			_state: 90, smo_grp: OVI		
Random	109	RF	SVMSMOTE	Over	0.8647
{classifier	: {boots	trap: False, o	l class_weight: None, crite	resampling erion: gini, ma	x features: 1.
			les_split: 8, n_estimators:		
			n_neighbors: 5, out_step	: 0.819182610	2746397, ran-
TPE	: 109, sr	no_grp: OVE RF	R, type: SVMSMOTE}} SVMSMOTE	Over	0.8717
IPE	9	Kr	SYMSMOTE	Over resampling	0.8/1/
{classifier	: {boots	trap: False, o	class_weight: balanced_s		erion: entropy,
			les_leaf: 6, min_sample		
			sub: {k_neighbors: 6,		
TPE	18	RF	state: 9, smo_grp: OVER SMOTENC	Over	0.887
112	10	Tu	SIMOTEIVE	resampling	0.007
			lass_weight: balanced, o	criterion: gini,	
			_samples_split: 4, n_esti		
		ub: {categorie type: SMOTE	cal_features: True, k_nei	ghbors: 5, rand	lom_state: 18,
TPE	27	RF	RandomOverSampler	Over	0.8647
112		1	Tunidomo (oroumpier	resampling	0.0017
			iss_weight: balanced, crit		
			in_samples_split: 11, n_		
	tate: 27}.	, sub: {randoi	n_state: 27, smo_grp: OV	ER, type: Ran	domOverSam-
pler}} TPE	29	RF	SMOTENC	Over	0.8785
112		1	bivio 12. (c	resampling	0.0702
			ass_weight: None, criter		
			les_split: 7, n_estimators:		
OVER, ty			: True, k_neighbors: 5,	random_state:	29, smo_grp:
TPE	36	RF	SMOTENC	Over	0.879
				resampling	
			class_weight: balanced		riterion: gini,
			les_leaf: 4, min_sample		
			sub: {categorical_feature , type: SMOTENC}}	s. True, k_nerg	110018. 3, 1411-
TPE	39	RF	RandomOverSampler	Over	0.8643
				resampling	
			ss_weight: balanced, crit		
			samples_split: 5, n_estingstate: 39, smo_grp: OV		
pler}}	. 37], 3	uo. (randoni_	_state. 35, smo_grp. 04	EK, type. Kan	domoversam-
TPE	59	RF	SVMSMOTE	Over	0.8755
			<u> </u>	resampling	
			class_weight: balanced_s		
			les_leaf: 5, min_sample , sub: {k_neighbors: 2,		
			state: 59, smo_grp: OVE		
TPE	79	RF	SMOTETomek	Combine	0.876
	L			resampling	
			ass_weight: balanced, crit		
			n_samples_split: 11, n_e state: 79, smo_grp: COMI		
TPE	90 90	RF	SMOTE	Over	0.8654
				resampling	
			lass_weight: balanced_s	ubsample, crite	
			les_leaf: 4, min_samples		
		_state: 90}, su	b: {k_neighbors: 5, rando	m_state: 90, sm	o_grp: OVER,
type: SMO	109	RF	SMOTENC	Over	0.8867
	,			resampling	3.0007
{classifier		•		_subsample, c	
			es_leaf: 1, min_sample		
			}, sub: {categorical_feat		_neighbors: 9,
ranuom_s	atc. 109	, smo_grp: O	VER, type: SMOTENC}	ı	

TABLE S-11 "YEAST1"

GM Method Seed Classifier Resampler Res.Group Grid RF Neighbourhood Under 0.7211 CleaningRule resampling RF 0.7217 Grid 18 Neighbourhood Under CleaningRule resampling Grid 27 RF Neighbourhood Under 0.7224 CleaningRule resampling Grid 29 LR RandomUnderSampler 0.7181 Under resampling Grid 36 RF Neighbourhood Under 0.7163 CleaningRule resampling 0.7171 Grid 39 RF Neighbourhood Under CleaningRule resampling 59 LR 0.7148 Grid EditedNearest Under Neighbours resampling 79 RF 0.7212 Grid Neighbourhood Under CleaningRule resampling 90 SVM CondensedNearest 0.7153 Grid Under Neighbour resampling EditedNearest Grid 109 LR 0.7148 Under Neighbours resampling Random RF SMOTENC 0.734 resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: entropy, max_features: sqrt, min_samples_leaf: 19, min_samples_split: 17, n_estimators: 80, name: RF, random_state: 9}, sub: {categorical_features: True, k_neighbors: 4, random_state: 9, smo_grp: OVER, type: SMOTENC}} RF TomekLinks 0.7257 Random 18 Under resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: gini, max_features: 1, min_samples_leaf: 19, min_samples_split: 16, n_estimators: 138, name: RF, random_state: 18}, sub: {smo_grp: UNDER, type: TomekLinks}} 27 RF BorderlineSMOTE Random Over resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: sqrt, min_samples_leaf: 7, min_samples_split: 17, n_estimators: 126, name: RF, random_state: 27}, sub: {k_neighbors: 4, kind: borderline-1, m_neighbors: 7, random_state: 27, smo_grp: OVER, type: BorderlineSMOTE}} 29 RF RandomOverSampler Random Over resampling {classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: gini, max_features: log2, min_samples_leaf: 15, min_samples_split: 6, n_estimators: 143, name: RF, random_state: 29}, sub: {random_state: 29, smo_grp: OVER, type: RandomOverSampler}} RandomOverSampler Random Over resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: log2, min_samples_leaf: 12, min_samples_split: 11, n_estimators: 63, name: RF, random_state: 36}, sub: {random_state: 36, smo_grp: OVER, type: RandomOverSampler}} OneSidedSelection Under 0.7285 Random resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: sqrt, min_samples_leaf: 14, min_samples_split: 8, n_estimators: 126, name: RF, random_state: 39}, sub: {n_neighbors: 10, n_seeds_S: 13, random_state: 39, smo_grp: UNDER, type: OneSidedSelection}} 59 SMOTE RF Over Random resampling {classifier: {bootstrap: False, class_weight: None, criterion: gini, max_features: log2, min_samples_leaf: 16, min_samples_split: 13, n_estimators: 22, name: RF, ran-dom_state: 59}, sub: {k_neighbors: 4, random_state: 59, smo_grp: OVER, type: SMOTE}}

resampling

{classifier: {bootstrap: True, class_weight: balanced, criterion: entropy, max_features: log2, min_samples_leaf: 18, min_samples_split: 18, n_estimators: 30, name: RF,

Random

random_state: 79}, sub: {smo_grp: NO, type: NO}}
continued on the next column

resampling

TABLE S-11 "YEAST1" – CONTINUED FROM PREVIOUS COLUMN

		ST1" – CON	TINUED FROM PREVI		
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	TomekLinks	Under	0.7334
(-1:6	. (1 4 .	t	1 1-14- 1-1 1 -	resampling	
			class_weight: balanced_s es_leaf: 11, min_sample		
			sub: {smo_grp: UNDER,		
Random	109	RF	ADASYN	Over	0.7294
				resampling	
			lass_weight: balanced,		
	tate: 109		min_samples_split: 18, eighbors: 2, random_state		
TPE	9	RF	ADASYN	Over	0.7335
				resampling	
			class_weight: None, crit		
			nin_samples_split: 14, 1		
ADASYN		sub: {n_ner	ghbors: 7, random_state	e: 9, smo_grp:	OVER, type:
TPE	18	RF	OneSidedSelection	Under	0.7294
	10	"	onesiacuseiceusii	resampling	0.725.
{classifier	: {boots	trap: True, o	lass_weight: balanced,	criterion: gini,	max_features:
			_samples_split: 13, n_es		
			nbors: 7, n_seeds_S: 4,	random_state:	18, smo_grp:
TPE	type: On	eSidedSelect	BorderlineSMOTE	Over	0.7348
IFE	21	KI.	BorderiniesMOTE	resampling	0.7346
{classifier	: {boots	strap: True, o	class_weight: balanced_s		erion: entropy,
			es_leaf: 7, min_samples		
			sub: {k_neighbors: 4, kin		, m_neighbors:
			OVER, type: BorderlineS		0.5245
TPE	29	RF	RandomOverSampler	Over	0.7345
{classifier	· {boots	tran: True o	lass_weight: None, crite	resampling erion: entropy	max features:
			n_samples_split: 4, n_es_state: 29, smo_grp: OV		
TPE	36	RF	Instance	Under	0.733
			HardnessThreshold	resampling	
			class_weight: balanced_s		
			les_leaf: 5, min_sample:		
			sub: {cv: 7, estimator: de ceHardnessThreshold}}	cision-tree, ran	dom_state: 50,
TPE	39	RF	OneSidedSelection	Under	0.732
				resampling	
			ass_weight: balanced, cri		
			samples_split: 7, n_estir		
		ub: {n_neign ieSidedSelect	bors: 16, n_seeds_S: 11	, random_state:	39, smo_grp:
TPE	59	RF	No	No	0.7322
11.2		10	resampling	resampling	0.7322
			class_weight: balanced	_subsample, c	
			es_leaf: 13, min_sample		estimators: 57,
			sub: {smo_grp: NO, type		0.530
TPE	79	RF	TomekLinks	Under	0.729
{classifier	· {boot	stran: True	class_weight: balanced	resampling	riterion: gini,
			oles_leaf: 9, min_samples		
			ub: {smo_grp: UNDER,		
TPE	90	RF	OneSidedSelection	Under	0.733
(-1 '0	(1-		description to the state of the	resampling	
			class_weight: balanced_s leaf: 6, min_samples_spli		
			{n_neighbors: 15, n_see		
			idedSelection}}		
TPE	109	RF	SMOTE	Over	0.7327
	L			resampling	
			lass_weight: None, criter		
			amples_split: 8, n_estin		
SMOTE}		sub: {K_neig	hbors: 2, random_state:	109, smo_grp:	OVEK, type:

TABLE S-12 "HABERMAN"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	RF	Neighbourhood	Under	0.6819
~	1.0		CleaningRule	resampling	
Grid	18	LR	Instance	Under	0.6706
0 : 1	25	* 5	HardnessThreshold	resampling	0.4445
Grid	27	LR	Instance	Under	0.6665
~			HardnessThreshold	resampling	
Grid	29	LR	Instance	Under	0.6626
0 : 1	26	D.F.	HardnessThreshold	resampling	0.660
Grid	36	RF	Neighbourhood	Under	0.6685
~	•		CleaningRule	resampling	0.4
Grid	39	LR	Instance	Under	0.671
0.11	50	DE	HardnessThreshold	resampling	0.661
Grid	59	RF	EditedNearest	Under	0.6614
			Neighbours	resampling	
Grid	79	LR	NearMiss	Under	0.6614
				resampling	
Grid	90	RF	SMOTEENN	Combine	0.6669
				resampling	
Grid	109	LR	Instance	Under	0.667
	<u></u>	<u> </u>	HardnessThreshold	resampling	
Random	9	RF	ADASYN	Over	0.6839
		1		resampling	
{classifier	: {boots	trap: True, cl	ass_weight: balanced,		y, max_features:
			n samples split: 10,		
			ighbors: 6, random_st		
ADASYN		ouo. (II_IIC	.5o.is. o, iandom_st	,, sino_gi	.p. Other, type
Random	18	RF	SMOTEENN	Combine	0.6838
Nationin	10	KF	SWICHEEMIN	I	0.0838
(1 :6	(1 ,	T 1	1 1 N	resampling	C . 1 0
			lass_weight: None, crit		
			amples_split: 13, n_es		
dom state	: 18}. sı	ıb: {random	state: 18, smo_grp: CC	OMBINE, type:	SMOTEENN}}
state	- ,, ,,	(, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
Random	27	RF	BorderlineSMOTE	Over	
				Over	
Random {classifier log2, min random_st	: {boots n_sample tate: 27}	RF strap: True, oss_leaf: 13, strap: true, oss_leaf: 13,	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: born	Over resampling , criterion: gir n_estimators: derline-1, m_ne	0.6994 ni, max_features: 90, name: RF
Random {classifier log2, min random_st dom_state	27 : {boots n_sample tate: 27} : 27, sm	RF strap: True, ossleaf: 13, sub: {k_noogrp: OVEI	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bord R, type: BorderlineSMO	Over resampling , criterion: gir n_estimators: derline-1, m_norE}}	0.6994 ni, max_features: 90, name: RF. eighbors: 7, ran-
Random {classifier log2, min random_st	: {boots n_sample tate: 27}	RF strap: True, oss_leaf: 13, strap: true, oss_leaf: 13,	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: born	Over resampling , criterion: gir n_estimators: derline-1, m_normE}}	0.6994 ni, max_features: 90, name: RF. eighbors: 7, ran-
Random {classifier log2, min random_st dom_state Random	27 : {boots n_sample tate: 27} : 27, sm	RF trap: True, or seleaf: 13, sub: {k_nor o_grp: OVER	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bor R, type: BorderlineSMO NearMiss	Over resampling , criterion: gir n_estimators: derline-1, m_noTE}} Under resampling	0.6994 ni, max_features: 90, name: RF eighbors: 7, ran-
Random {classifier log2, min random_st dom_state Random}	27 : {boots n_sample tate: 27} : 27, sm 29	RF trap: True, or es_leaf: 13, sub: {k_noogrp: OVER LR 55.575807352	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bor R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14	Over resampling , criterion: gir n_estimators: derline-1, m_no DTE} Under resampling 850718351798	0.6994 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987
Random {classifier log2, mir random_st dom_state Random} {classifier penalty_so	27 : {boots n_sample tate: 27} : 27, sm 29 : {C: 6	RF trap: True, o es_leaf: 13, , sub: {k_ne} o_grp: OVEH LR 55.575807352 2+sag, rand	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bord R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14 tom_state: 29, tol:	Over resampling , criterion: gir n_estimators: derline-1, m_n: DTE}} Under resampling 850718351798: 0.05860965350	0.6992 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 12002736}, sub
Random {classifier log2, mir random_st dom_state Random} {classifier penalty_sc {n_neighb}	27 : {boots n_sample tate: 27} : 27, sm 29 : {C: 6	RF trap: True, o es_leaf: 13, , sub: {k_ne} o_grp: OVEH LR 55.575807352 2+sag, rand	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bor R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14	Over resampling , criterion: gir n_estimators: derline-1, m_n: DTE}} Under resampling 850718351798: 0.05860965350	0.6992 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 12002736}, sub
Random {classifier log2, mir random_st dom_state Random {classifier penalty_sc {n_neighb1}}	27 : {boots n_sample tate: 27}: 27, sm 29 : {C: 60 olver: 1 oors: 5, 1	RF trap: True, oss_leaf: 13, t, sub: {k_noo_grp: OVEH LR 55.575807352 2+sag, rand n_neighbors_	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bor k, type: BorderlineSMO NearMiss 207308, 11_ratio: 0.14 om_state: 29, tol: ver3: 15, smo_grp: UN	Over resampling , criterion: gir n_estimators: derline-1, m_n; DTE}} Under resampling 850718351798 0.05860965350 NDER, type: N	0.6992 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 12002736}, sub earMiss, version
Random {classifier log2, mir random_st dom_state Random} {classifier penalty_sc {n_neighb}	27 : {boots n_sample tate: 27} : 27, sm 29 : {C: 6	RF trap: True, o es_leaf: 13, , sub: {k_ne} o_grp: OVEH LR 55.575807352 2+sag, rand	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bord R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14 tom_state: 29, tol:	Over resampling , criterion: gir n_estimators: derline-1, m_n: DTE}} Under resampling 850718351798: 0.05860965350	0.6992 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 12002736}, sub earMiss, version
Random {classifier log2, mir random_st dom_state Random {classifier penalty_sc {n_neighb 1}} Random	27 : {boots a_sample tate: 27}: 27, sm 29 : {C: 6} : {C: 6} John School	RF trap: True, os. leaf: 13, sub: {k_noo_grp: OVEI} LR 55.575807352 2+sag, rand n_neighbors_	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bord R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14 tom_state: 29, tol: ver3: 15, smo_grp: UN NearMiss	Over resampling criterion: girn_estimators: derline-1, m_notE}} Under resampling 850718351798: 0.05860965350; Under resampling resampling Number Resampling	0.6994 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 0.25, name: LR 0.2002736}, sub earMiss, version 0.6973
Random {classifier log2, mir random_st dom_state Random {classifier penalty_sc {n_neighb 1}} Random	27 : {boots a_sample tate: 27}: 27, sm 29 : {C: 6} : {C: 6} John St. 1	RF trap: True, os. leaf: 13, sub: {k_noo_grp: OVEI} LR 55.575807352 2+sag, rand n_neighbors_	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bord R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14 tom_state: 29, tol: ver3: 15, smo_grp: UN NearMiss	Over resampling criterion: girn_estimators: derline-1, m_notE}} Under resampling 850718351798: 0.05860965350; Under resampling resampling Number Resampling	0.6994 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 0.25, name: LR 0.2002736}, sub earMiss, version 0.6973
Random {classifier log2, min random_st dom_state Random}{classifier penalty_sc {n_neighb1}} Random {classifier domesting the state of t	27 : {boots a_sample tate: 27}: 27, sm 29 : {C: {C: {C: {5}}}	RF trap: True, os. leaf: 13, sub: {k_noo_grp: OVEI} LR 55.575807352 2+sag, rand n_neighbors_ LR 52.967651475	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bord R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14 10m_state: 29, tol: ver3: 15, smo_grp: UN NearMiss 1666629, 11_ratio: 0.44	Over resampling criterion: girn_estimators: derline-1, m_nortE}} Under resampling 850718351798: 0.05860965350; DER, type: N Under resampling 402290753558	0.6994 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 92002736}, sub earMiss, version 0.6973 415, name: LR
Random {classifier log2, mir random_st dom_state Random {classifier penalty_sc {n_neighb 1}} Random {classifier penalty_sc tops }	27 : {boots a_sample tate: 27}: 27, sm 29 : {C: 6} : {C: 6} : {C: 5} : {C: 5}	RF trap: True, oss_leaf: 13, l, sub: {k_noo_grp: OVEI} LR LR 55.575807352 2+sag, rand n_neighbors_ LR 52.967651475 asticnet+saga	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: bord R, type: BorderlineSMO NearMiss 207308, 11_ratio: 0.14 om_state: 29, tol: ver3: 15, smo_grp: UN NearMiss 166629, 11_ratio: 0.44 random_state: 36, to	Over resampling , criterion: gi, r. n_estimators: derline-1, m_n/OTE}} Under resampling 850718351798 0.05860965350 NDER, type: N Under resampling 402290753558 1: 0.069155351	0.6992 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 12002736}, sub earMiss, version 0.6973 415, name: LR 56949242}, sub
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Random {classifier log2, mir random_st dom_state Random {classifier penalty_sc {n_neighb 1}} Random {classifier penalty_sc {n_neighb 1}} Random {classifier scale, gai ity: False {n_neighb 1}} Random {classifier scale, gai ity: False {n_neighb 1}} Random {classifier None, mir random_st ADASYN Random {classifier	27 : {boots sample late: 27} : 27, sm 29 : {C: 6 olver: 1 ors: 5, 1 36 : {C: 5} : {C: 5} 39 : {C: 13 mma_val , randor ors: 7, 1 59 : {boots n_sample late: 59} } 79 : {boots : {boots }	RF trap: True, cs. leaf: 13, sub: {k_nco_grp: OVEI} LR 55.575807352 2+sag, rand_neighbors_ LR 52.967651475 asticnet+sagan_neighbors_ SVM 2.865325015: lue: 3.68598 n_state: 39, n_neighbors_ RF trap: True, cs. leaf: 11, sub: {n_neighbors_	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: boro R, type: BorderlineSMO NearMiss 207308, 11_ratio: 0.14 om_state: 29, tol: ver3: 15, smo_grp: UN NearMiss 666629, 11_ratio: 0.44 , random_state: 36, to ver3: 10, smo_grp: UN NearMiss 50488, coef0: 0.304051 3178779961, kernel: shrinking: False, tol: ver3: 12, smo_grp: UN ADASYN class_weight: None, comin_samples_split: 7 eighbors: 8, random_st TomekLinks lass_weight: balanced, lass_weight: balanced, lass_weight: balanced,	Over resampling n_estimators: derline-1, m_m oter standing length of the standing length of	0.6994 ni, max_features: 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 12002736}, sub- earMiss, version: 0.6973 415, name: LR 56949242}, sub- earMiss, version: 0.6979 egree: 4, gamma: SVM, probabil- 99591617}, sub- earMiss, version: 0.6876 ny, max_features: 62, name: RF rp: OVER, type: 0.6945 max_features: 1
Random {classifier log2, mir random_st dom_state Random {classifier penalty_sc {n_neighb 1}} Random {classifier penalty_sc {n_neighb 1}} Random {classifier scale, gar ity: False {n_neighb 1}} Random {classifier random_st ADASYN Random {classifier none, mir andom_st ADASYN Random {classifier min_samp	27 : {boots _sample tate: 27} : 27, sm 29 : {C: 6} : {C: 5} 36 : {C: 5} 39 : {C: 13: 39 : {C: 13: 7andor 59 : {boots 59 } } 79 : {boots 6 : {C: 13: 79 : {boots 6 : {C: 13: 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {	RF trap: True, cs. leaf: 13, sub: {k_neo_grp: OVEI} LR 55.575807352 2+sag, rand a_neighbors_ LR 52.967651475 asticnet+saga a_neighbors_ SVM 2.865325015: tue: 3.68598 n_state: 39, a_neighbors_ RF trap: True, cs. leaf: 11, sub: {n_neconstruction} RF trap: True, cl. 6, min_samp	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: boro R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14 om_state: 29, tol: ver3: 15, smo_grp: UN NearMiss 1066629, 11_ratio: 0.44, random_state: 36, to ver3: 10, smo_grp: UN NearMiss 50488, coef0: 0.304051 3178779961, kernel: shrinking: False, tol: ver3: 12, smo_grp: UN ADASYN class_weight: None, cr min_samples_split: 7, eighbors: 8, random_st TomekLinks lass_weight: balanced, else_split: 7, n_estimato lass_weight: 7, n_estimato else_split: 7, n_estimato else_else_else_else_else_else_else_else	Over resampling n_estimators: derline-1, m_m oter standing length of the standing length of	0.6994 ni, max_features: 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 12002736}, sub- earMiss, version: 0.6973 415, name: LR 56949242}, sub- earMiss, version: 0.6979 egree: 4, gamma: SVM, probabil- 99591617}, sub- earMiss, version: 0.6876 ny, max_features: 62, name: RF rp: OVER, type: 0.6945 max_features: 1
Random {classifier log2, mir random_st dom_state Random {classifier penalty_sc {n_neighb 1}} Random {classifier penalty_sc {n_neighb 1}} Random {classifier scale, gar ity: False {n_neighb 1}} Random {classifier random_st ADASYN Random {classifier none, mir andom_st ADASYN Random {classifier min_samp	27 : {boots _sample tate: 27} : 27, sm 29 : {C: 6} : {C: 5} 36 : {C: 5} 39 : {C: 13: 39 : {C: 13: 7andor 59 : {boots 59 } } 79 : {boots 6 : {C: 13: 79 : {boots 6 : {C: 13: 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {boots 6 : {C: 13: 79 : {boots 79 : {	RF trap: True, cs. leaf: 13, sub: {k_neo_grp: OVEI} LR 55.575807352 2+sag, rand a_neighbors_ LR 52.967651475 asticnet+saga a_neighbors_ SVM 2.865325015: tue: 3.68598 n_state: 39, a_neighbors_ RF trap: True, cs. leaf: 11, sub: {n_neconstruction} RF trap: True, cl. 6, min_samp	BorderlineSMOTE class_weight: balanced min_samples_split: 4, eighbors: 9, kind: boro R, type: BorderlineSMO NearMiss 107308, 11_ratio: 0.14 tom_state: 29, tol: ver3: 15, smo_grp: UN NearMiss 1066629, 11_ratio: 0.44 , random_state: 36, to ver3: 10, smo_grp: UN NearMiss 50488, coef0: 0.304051 3178779961, kernel: shrinking: False, tol: ver3: 12, smo_grp: UN ADASYN class_weight: None, ci min_samples_split: 7, eighbors: 8, random_st TomekLinks lass_weight: 7, n_estimato type: TomekLinks}	Over resampling criterion: gin n_estimators: derline-1, m_note process of the pro	0.6994 ni, max_features 90, name: RF eighbors: 7, ran- 0.6987 925, name: LR 12002736}, sub earMiss, version 0.6973 415, name: LR 56949242}, sub earMiss, version 0.6979 egree: 4, gamma SVM, probabil- 99591617}, sub earMiss, version 0.6876 oy, max_features 62, name: RF rp: OVER, type 0.6945

TABLE S-12 "HABERMAN" – CONTINUED FROM PREVIOUS COLUMN

Random	Seed	Classifier	Resampler	Res.Group	GM
	90	RF	ADASYN	Over	0.6907
(1 'C	<u> </u>	<u></u>		resampling	
			lass_weight: balanced		
			nin_samples_split: 18 ighbors: 5, random_st		
ADASYN		, sub. (II_IIC	ignoors. 5, random_st	.atc. 70, smo_g	ip. Over, type.
Random	109	RF	ADASYN	Over	0.6926
	"			resampling	
{classifier			class_weight: balance		
	, randon	n_state: 109},	les_leaf: 8, min_sam, sub: {n_neighbors:		
TPE	9	RF	ADASYN	Over	0.7094
{classifier	 	otuoni Tuvo	class_weight: balance	resampling	
			ples_leaf: 9, min_sam		
			b: {n_neighbors: 8, ra		
type: AD			(
TPE	18	RF	ADASYN	Over	0.698
	<u> </u>			resampling	
			lass_weight: balanced		
	m_state:		eaf: 18, min_samples_ neighbors: 4, random_		
TPE	27	RF	SMOTE	Over	0.7012
				resampling	
			lass_weight: balanced		
			es_leaf: 14, min_samp		
		_state: 27}, su	b: {k_neighbors: 9, rar	ndom_state: 27,	smo_grp: OVER,
type: SMO	29	RF	ADASYN	Over	0.7052
IFE	29	I KI	ADASTN	resampling	0.7032
{classifier	: {bootst	trap: True, cla	ss_weight: balanced,		ov. max features:
	: 29},		_samples_split: 15, n_ hbors: 6, random_sta		
TPE	36	RF	NearMiss	Under	0.7038
(1 'C	. Cl. ·	tron: True ale	 ass_weight: None, cri	resampling	y factures: log2
			ass_weight. None, en		ix_icatures. 10g2,
			oles split: 3 n estimat	tors: 7 name: R	PF random state:
min_samp	oles_leaf:	7, min_samp	oles_split: 3, n_estimateighbors ver3: 11, smo		
min_samp 36}, sub:	oles_leaf: {n_neigl	7, min_samp	oles_split: 3, n_estimateighbors_ver3: 11, smo		
min_samp 36}, sub: version: 1	oles_leaf: {n_neigl	7, min_samp			, type: NearMiss,
min_samp 36}, sub: version: 1 TPE	oles_leaf: {n_neight}}	7, min_samp	eighbors_ver3: 11, smo	O_grp: UNDER Over resampling	, type: NearMiss,
min_samp 36}, sub: version: 1 TPE {classifier	oles_leaf: {n_neight}} 39 :: {boots	RF True, c	SMOTE SMOTE Class_weight: None, c	Over resampling riterion: entrop	, type: NearMiss, 0.703 y, max_features:
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa	les_leaf: {n_neight} } 39 : {boots umples_le	RF Rrue, ceaf: 18, min_samp	SMOTE SMOTE class_weight: None, c.samples_split: 2, n_e	Over resampling riterion: entropestimators: 114,	y, max_features:
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state	oles_leaf: {n_neight}} 39 :: {boots amples_leads: 39},	RF Rrue, ceaf: 18, min_samp	SMOTE SMOTE Class_weight: None, c	Over resampling riterion: entropestimators: 114,	y, max_features:
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE}	oles_leaf: {n_neigl} }} 39 :: {boots amples_le :: 39},	RF strap: True, ceaf: 18, min_sub: {k_neight	SMOTE lass_weight: None, c samples_split: 2, n_e abors: 9, random_sta	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr	y, max_features: name: RF, ran- p: OVER, type:
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE}	oles_leaf: {n_neight}} 39 :: {boots amples_leads: 39},	RF Rrue, ceaf: 18, min_samp	SMOTE SMOTE class_weight: None, c.samples_split: 2, n_e	Over resampling riterion: entropestimators: 114,	y, max_features: name: RF, ran- p: OVER, type:
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier	bles_leaf: {n_neigl} }} 39 :: {boots amples_le :: 39}, 9 59 :: {boots:	RF R	SMOTE lass_weight: None, c, samples_split: 2, n_e hors: 9, random_sta SMOTETomek lass_weight: None, c	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features:
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa	oles_leaf: {n_neigl} } 39 : {boots amples_le :: 39}, :: } 59 :: {boots amples_le	RF RF sub: {k_neight	SMOTE lass_weight: None, c samples_split: 2, n_e bors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_	Over resampling riterion: entrop stimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41,	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran-
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state	bles_leaf: {n_neight} } 39 :: {boots imples_le :: 39}, s } 59 :: {boots imples_le :: 59}, su	RF RF RF trap: True, c caf: 18, min_ sub: {k_neighter trap: True, c caf: 13, min_ http://distriction.org/ k_neighter trap: true, c	sMOTE lass_weight: None, c samples_split: 2, n_e abors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_ tate: 59, smo_grp; CO	Ogrp: UNDER Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41,	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- smare: RF, ran- smootETomek}}
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state	oles_leaf: {n_neigl} } 39 : {boots amples_le :: 39}, :: } 59 :: {boots amples_le	RF RF sub: {k_neight	SMOTE lass_weight: None, c samples_split: 2, n_e bors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, bMBINE, type:	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- smare: RF, ran- smootETomek}}
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state \$SMOTE} TPE {classifier 1, min_sa dom_state \$TPE	Section	RF	SMOTE lass_weight: None, c samples_split: 2, n_e abors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_ state: 59, smo_grp: CO BorderlineSMOTE	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, DMBINE, type: Over resampling	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek}}
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier TPE {classifier	Section	RF	SMOTE lass_weight: None, c, samples_split: 2, n_e	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, MMBINE, type: Over resampling ced_subsample,	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek}} 0.705 criterion: gini.
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier 1, min_sa dom_state TPE {classifier adm_state TPE {classifier for state	Section Sect	RF	sMOTE lass_weight: None, c samples_split: 2, n_e abors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_ state: 59, smo_grp: CC BorderlineSMOTE class_weight: balant les_leaf: 15, min_samples_split: 11, m_ state: 59, smo_grp: CC	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, bMBINE, type: Over resampling ced_subsample, ples_split: 10, n	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek } 0.705 criterion: gini _estimators: 113,
min_samp 36], sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier quadrate TPE {classifier Resident Reside		RF trap: True, ceaf: 18, min_sub: {k_neigle} RF trap: True, ceaf: 18, min_sub: {k_neigle} RF trap: True, ceaf: 13, min_tb: {random_s} RF strap: True, ceaf: 13, min_sub: {random_s}	SMOTE lass_weight: None, c, samples_split: 2, n_e	Ogrp: UNDER Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, MBINE, type: Over resampling eed_subsample, ples_split: 10, n kind: borderline	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek } 0.705 criterion: gini, _estimators: 113,
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier 1, min_sa dom_state TPE {classifier persions to the complete of the complete		RF trap: True, ceaf: 18, min_sub: {k_neigle} RF trap: True, ceaf: 18, min_sub: {k_neigle} RF trap: True, ceaf: 13, min_tb: {random_s} RF strap: True, ceaf: 13, min_sub: {random_s}	smore: 11, smore: smore: 11, smore: smore: 11, smore: smore: 2, n_e abors: 9, random_star smore: 9, random_star smore: 10, n_e abors: 9, smo_grp: CC BorderlineSMOTE class_weight: balance: 2, smo_grp: CC BorderlineSMOTE class_weight: balance: 15, min_sam_ub: {k_neighbors: 6, }	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, DMBINE, type: Over resampling ced_subsample, ples_split: 10, n kind: borderline neSMOTE}	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- sMOTETomek} 0.705 criterion: gini, _estimators: 113, -1, m_neighbors:
min_samp 36], sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier 1, min_sa dom_state TPE {classifier 1, min_sa dom_state TPE {classifier per max_feate name: RF 9, random TPE	Section Sect	RF trap: True, ceaf: 18, min_sub: {k_neigle} RF trap: True, ceaf: 13, min_sub: {random_s} RF trap: True, ceaf: 13, min_ub: {random_s} RF trap: True, ceaf: 13, min_ub: {random_s} RF trap: True, ceaf: 13, min_ub: {random_s} RF	SMOTE lass_weight: None, c, samples_split: 2, n_e, bors: 9, random_sta SMOTETomek lass_weight: None, c, samples_split: 11, n_tate: 59, smo_grp: CO BorderlineSMOTE class_weight: balancles_leaf: 15, min_sam, ub: {k_neighbors: 6, 1} OVER, type: Borderlin ADASYN	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, MMBINE, type: Over resampling red_subsample, ples_split: 10, n kind: borderline neSMOTE} Over resampling	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek}} 0.705 criterion: gini, _estimators: 113, -1, m_neighbors:
min_samp 36], sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier 1, min_sa dom_state TPE {classifier 1, min_sa dom_state TPE {classifier TPE {classifier TPE {classifier Classifier TPE {classifier Classifier TPE {classifier	oles_leaf: {n_neigl} } 39 :: {boots imples_le :: 39}, ss } 59 :: {boots imples_le :: 59}, su 79 :: {boots ires: Non c, random c, state: 7 90 :: {boots ires: Non c, random c, state: 7 90 :: {boots c, random c, state: 7 90 :: {boots c, random c, state: 7 90 :: {boots	RF trap: True, c eaf: 18, min_ sub: {k_neigl} RF trap: True, c eaf: 13, min_ ib: {random_s} RF strap: True, c eaf: 13, min_ ib: {random_s} RF strap: True, c e, min_sampl _state: 79}, s 19, smo_grp: 6 RF trap: True, c	smore sweight: None, c samples_split: 2, n_e abors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_ state: 59, smo_grp: CC BorderlineSMOTE class_weight: balances_leaf: 15, min_sam ub: {k_neighbors: 6, lovER, type: BorderlineSMOTE} lass_weight: balances_split: b	o_grp: UNDER Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, MBINE, type: Over resampling eed_subsample, ples_split: 10, n kind: borderline esMOTE} Over resampling resampling cetal subsample, ples_split: 10, n kind: borderline esMOTE} Over resampling cetal subsample, c	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek} 0.705 criterion: gini, _estimators: 113, -1, m_neighbors: 0.7035 riterion: entropy,
min_samp 36], sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier 1, min_sa dom_state TPE {classifier p, random TPE {classifier classifier classifier classifier classifier p, random TPE {classifier classifier c	oles_leaf: {n_neigl} } 39 : {boots imples_le :: 39}, s 59 :: {boots imples_le :: 59}, su 79 :: {boots imples_le :: 59}, su 79 :: {boots imples_le :: {boots imp	RF trap: True, ceaf: 18, min_sub: {k_neightrap: True, ceaf: 13, min_sub: {random_s} RF trap: True, ceaf: 13, min_sub: {random_s} RF trap: True, ceaf: 13, min_sub: {random_s} RF strap: True, ceaf: 13, min_sub: {random_s} RF trap: True, ceaf: 13, min_sample_state: 79, smo_grp: 0 RF	sighbors_ver3: 11, sme SMOTE lass_weight: None, c samples_split: 2, n_e abors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_ state: 59, smo_grp: CC BorderlineSMOTE class_weight: balancet les_leaf: 15, min_samp ub: {k_neighbors: 6, l OVER, type: Borderlin ADASYN lass_weight: balancet les_leaf: 14, min_samp	Ogrp: UNDER Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, WhBINE, type: Over resampling ced_subsample, ples_split: 10, n kind: borderline neSMOTE} Over resampling d_subsample, c ples_split: 18, n	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek} 0.7035 criterion: giniestimators: 113, -1, m_neighbors: 0.7035 riterion: entropy, _estimators: 137.
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier max_featt name: RF 9, random TPE {classifier max_featt name: RF 9, random TPE	oles_leaf: {n_neigl} } 39 : {boots imples_le :: 39}, si 59 : {boots imples_le :: 59}, su 79 : {boot inres: Non in_state: 7 90 :: {boots in_state: 7 90 :: {boots in_state: 7 9	RF trap: True, ceaf: 18, min_sub: {k_neight RF trap: True, ceaf: 18, min_sub: {k_neight RF trap: True, ceaf: 13, min_sub: {random_seaf: 13, min_sub: {random_seaf: 13, min_seaf: 13,	smore sweight: None, c samples_split: 2, n_e abors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_ state: 59, smo_grp: CC BorderlineSMOTE class_weight: balances_leaf: 15, min_sam ub: {k_neighbors: 6, lovER, type: BorderlineSMOTE} lass_weight: balances_split: b	Ogrp: UNDER Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, WhBINE, type: Over resampling ced_subsample, ples_split: 10, n kind: borderline neSMOTE} Over resampling d_subsample, c ples_split: 18, n	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek}} 0.7035 criterion: gini, _estimators: 113, -1, m_neighbors: 0.7035 riterion: entropy, _estimators: 137,
min_samp 36], sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier max_featu name: RF 9, random TPE {classifier max_featu name: RF 4, random TPE {classifier max_featu name: AF TPE }	oles_leaf: {n_neigl} } 39 :: {boots amples_le :: 39}, s: } 59 :: {boots timples_le :: 59}, su 79 :: {boots timples_le :: 59}, su 79 :: {boots timples_le :: 59, su 79 :: {boots timples_le :: 79 79 79 79 79 79 79 79	RF trap: True, ceaf: 18, min_sub: {k_neight RF trap: True, ceaf: 18, min_sub: {k_neight RF trap: True, ceaf: 13, min_sub: {random_seaf: 13, min_sub: {random_seaf: 13, min_seaf: 13,	SMOTE lass_weight: None, c, samples_split: 2, n_e, abors: 9, random_sta SMOTETomek lass_weight: None, c, samples_split: 11, n, state: 59, smo_grp: CO BorderlineSMOTE class_weight: balances, selection of the selection of th	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, DMBINE, type: Over resampling ced_subsample, ples_split: 10, nd combine neSMOTE} Over resampling ced_subsample, combine ples_split: 18, nd combine neSMOTE; 18, nd combine nesplicits 18, nd ndom_state: 90,	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- p: OVER, type: 0.6987 o.705 criterion: gini, _estimators: 113, -1, m_neighbors: 0.7035 riterion: entropy, _estimators: 137, smo_grp: OVER,
min_samp 36}, sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier max_featt name: RF 9, random TPE {classifier max_featt name: RF 9, random TPE	oles_leaf: {n_neigl} } 39 : {boots imples_le :: 39}, si 59 : {boots imples_le :: 59}, su 79 : {boot inres: Non in_state: 7 90 :: {boots in_state: 7 90 :: {boots in_state: 7 9	RF trap: True, ceaf: 13, min_sub: {k_neigle} RF trap: True, ceaf: 13, min_sub: {random_s} RF trap: True, ceaf: 13, min_sb: {random_s} RF trap: True, ceaf: 13, min_sb: {random_s} RF trap: True, ceaf: 19, sro_grp: 6 RF	sighbors_ver3: 11, sme SMOTE lass_weight: None, c samples_split: 2, n_e abors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_ state: 59, smo_grp: CC BorderlineSMOTE class_weight: balancet les_leaf: 15, min_samp ub: {k_neighbors: 6, l OVER, type: Borderlin ADASYN lass_weight: balancet les_leaf: 14, min_samp	Ogrp: UNDER Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, WhBINE, type: Over resampling ced_subsample, ples_split: 10, n kind: borderline neSMOTE} Over resampling d_subsample, c ples_split: 18, n	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek}} 0.7035 criterion: gini, _estimators: 113, -1, m_neighbors: 0.7035 riterion: entropy, _estimators: 137,
min_samp 36], sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier quantification the classifier max_featu name: RF 9, random TPE {classifier max_featu name: RF type: AD TPE	oles_leaf: {n_neigl} } 39 : {boots imples_le :: 39} 59 : {boots imples_le :: 59}, su 79 :: {boots imples_le :: 100 imples_le	RF trap: True, ceaf: 18, min_sub: {k_neigle} RF trap: True, ceaf: 18, min_sub: {k_neigle} RF trap: True, ceaf: 13, min_sub: {random_s} RF strap: True, ceaf: 13, min_sub: {random_s} RF strap: True, ceaf: 13, min_strap: True, ceaf: 13, min_strap: True, ceaf: 13, min_strap: True, ceaf: 13, min_strap: True, ceaf: 14, min_strap: True, ceaf	SMOTE lass_weight: None, c, samples_split: 2, n_e, abors: 9, random_sta SMOTETomek lass_weight: None, c, samples_split: 11, n, state: 59, smo_grp: CO BorderlineSMOTE class_weight: balances, selection of the selection of th	o_grp: UNDER Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, MBINE, type: Over resampling ed_subsample, ples_split: 10, n kind: borderline neSMOTE} Over resampling d_subsample, c ples_split: 18, n ndom_state: 90, Over resampling	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek} 0.7055 criterion: gini, _estimators: 113, -1, m_neighbors: 0.7035 riterion: entropy, _estimators: 137, smo_grp: OVER, 0.6969
min_samp 36], sub: version: 1 TPE {classifier 1, min_sa dom_state SMOTE} TPE {classifier 1, min_sa dom_state TPE {classifier max_featt name: RF 9, random TPE {classifier max_featt name: RF type: AD TPE {classifier featt name: RF type: AD TPE {classifier nax_featt name: RF type: AD TPE	oles_leaf: {n_neigl} } 39 :: {boots mples_le :: 39}, s: } 59 :: {boots mples_le :: 59}, su 79 :: {boots mres: Nor , random _state: 7 90 :: {boots mres: Nor	RF trap: True, ceaf: 13, min_sub: {Rneight trap: True, ceaf: 13, min_sub: {Rneight trap: True, ceaf: 13, min_sb: {random_s} RF trap: True, ceaf: 13, min_sb: {random_s} RF trap: True, ceaf: 13, min_samplostate: 79}, smo_grp: {Rneight trap: True, ceaf: min_samplostate: 90}, such trap: True, ceaf: min_samplostate: m	sighbors_ver3: 11, sme SMOTE lass_weight: None, c samples_split: 2, n_e abors: 9, random_sta SMOTETomek lass_weight: None, c samples_split: 11, n_ state: 59, smo_grp: CC BorderlineSMOTE class_weight: balance tes_leaf: 15, min_samp ub: {k_neighbors: 6, 1 OVER, type: Borderlin ADASYN lass_weight: balancee les_leaf: 14, min_samp b: {n_neighbors: 5, ran SMOTE	Over resampling riterion: entrop estimators: 114, te: 39, smo_gr Combine resampling riterion: entrop estimators: 41, DMBINE, type: Over resampling ced_subsample, chind: borderline neSMOTE} Over resampling fusure split: 10, n dom_state: 90, Over resampling fusure split: 18, n dom_state: 90, Over resampling fusu	y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- p: OVER, type: 0.6987 y, max_features: name: RF, ran- SMOTETomek}} 0.705 criterion: giniestimators: 113,1, m_neighbors: 0.7035 riterion: entropyestimators: 137, smo_grp: OVER. 0.6969 ni, max_features: 112, name: RF,

TABLE S-13 "VEHICLE2"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	RF	SVMSMOTE	Over resampling	0.9898
Grid	18	RF	SMOTENC	Over	0.9868
Grid	27	RF	SMOTETomek	resampling Combine	0.9899
Grid	29	RF	RandomOverSampler	Over Over	0.9891
Grid	36	RF	BorderlineSMOTE	resampling Over	0.9891
Grid	39	RF	SMOTE	resampling Over	0.9899
Grid	59	RF	SVMSMOTE	resampling Over	0.9921
Grid	79	RF	SVMSMOTE	resampling Over	0.9883
Grid	90	RF	BorderlineSMOTE	resampling Over	0.9883
Grid	109	RF	SVMSMOTE	resampling Over	0.9921
Random	9	RF	KMeansSMOTE	resampling Over	0.9853
				resampling	
			class_weight: None, crite _samples_split: 17, n_es		
dom_state	: 9}, sub	: {cluster_bal	ance_threshold: 0.023948	8298652457213	
Random	_state: 9	RF	VER, type: KMeansSMC SMOTE	Over	0.9868
Kandoni	10	IXI.	SMOTE	resampling	0.9808
log2, min	_sample: : 18},	s_leaf: 1, mii	ass_weight: balanced, cri n_samples_split: 4, n_est nbors: 3, random_state:	timators: 41, n	ame: RF, ran-
Random	27	RF	TomekLinks	Under	0.986
[alossifier	· (boote	stron: Folco	class_weight: balanced	resampling	ritarian: aini
max_featu	ires: log	2, min_samp	les_leaf: 3, min_sample	s_split: 4, n_e	estimators: 45,
Random	random	_state: 27}, s	ub: {smo_grp: UNDER, SVMSMOTE	Over	0.9892
				resampling	
			ass_weight: balanced, cri _samples_split: 17, n_es		
dom_state	: 29}, su	b: {k_neighbo	ors: 1, m_neighbors: 7, ou	t_step: 0.59770	
Random_s	36 36	smo_grp: Ov	ER, type: SVMSMOTE) SVMSMOTE	Over	0.986
rundom	50	144	0 1 11011012	resampling	0.500
{classifier	: {boots	trap: False, c	lass_weight: balanced,	criterion: gini,	max_features:
			_samples_split: 4, n_est ors: 3, m_neighbors: 6, ou		
			ER, type: SVMSMOTE		,
Random	39	RF	ADASYN	Over resampling	0.9867
			class_weight: balanced es_leaf: 10, min_sample	_subsample, c	
name: RF,	random		b: {n_neighbors: 4, rando		
type: ADA Random	59 59	RF	SMOTE	Over	0.9891
rumuom	"		S. TOTE	resampling	0.5051
			class_weight: balanced es_leaf: 1, min_samples		
name: RF, type: SMO		_state: 59}, su	b: {k_neighbors: 1, rando	m_state: 59, sm	no_grp: OVER,
Random	79	RF	ADASYN	Over resampling	0.9876
{classifier	: {boots	trap: False, o	class_weight: balanced,		max_features:
	: 79},		amples_split: 19, n_estinbors: 7, random_state:		
			con	tinued on the	next column

continued on the next column

TABLE S-13 "VEHICLE2" – CONTINUED FROM PREVIOUS COLUMN

Dandom	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	SMOTENC	Over	0.9883
				resampling	
			lass_weight: None, cri		
			mples_split: 10, n_es		
			cal_features: True, k_	neighbors: /, r	andom_state: 90
Random	109	type: SMOTE	SVMSMOTE	Over	0.989
Kandoni	109	KI.	SYMSMOTE	resampling	0.965
{classifier	: {boots	strap: False,	class_weight: balanced		riterion: entropy
			oles_leaf: 3, min_sam		
			}, sub: {k_neighbors		
			state: 109, smo_grp: C		
TPE	9	RF	BorderlineSMOTE	Over	0.9913
(alossifiar	: [boots	tron: Folso oi	 ass_weight: None, cri	resampling	y footures: log?
			oles_split: 5, n_estimate		
	_		nd: borderline-2, m_i		_
		type: Borderl		neignoord, o,	andom_state.
TPE	18	RF	BorderlineSMOTE	Over	0.9899
				resampling	
			class_weight: balanced		
			_samples_split: 8, n_c		
			hbors: 2, kind: bord		ignbors: 8, ran-
dom_state TPE	27 27	io_grp: OVER	R, type: BorderlineSMOTE BorderlineSMOTE	O(E)}	0.9898
1115	-'	IXI.	DorucinicsWOTE	resampling	0.9896
{classifier	: {boot	strap: True	class_weight: balance		criterion: gini
			les_leaf: 1, min_samp		
			sub: {k_neighbors: 7, 1		
		27, smo_grp:	OVER, type: Borderlin		
TPE	29	RF	SVMSMOTE	Over	0.9921
	L		class_weight: balance	resampling	criterion: gini
			state: 29, smo_grp: O		
TPE	36	RF	SVMSMOTE	Over	0.9945
(-1:6	. (1		-1	resampling	
			class_weight: baland les_leaf: 2, min_sam		
			, sub: {k_neighbors:		
			state: 36, smo grp: O'	VER. type: SVI	MOMOTETT
0.7923868			state: 36, smo_grp: O' ADASYN	VER, type: SVI Over	
0.7923868	37179554	455, random_			0.9914
0.7923868 TPE {classifier	37179554 39 : {bootst	455, random_ RF trap: False, cla	ADASYN ass_weight: balanced, c	Over resampling criterion: gini, m	0.9914 hax_features: sqrt
0.7923868 TPE {classifier min_samp	37179554 39 : {bootst	455, random_ RF trap: False, cla : 1, min_samp	ADASYN ass_weight: balanced, colles_split: 5, n_estimate	Over resampling criterion: gini, m ors: 20, name: F	0.9914 nax_features: sqrt RF, random_state
0.7923868 TPE {classifier min_samp 39}, sub:	37179554 39 : {bootst bles_leaf: {n_neigl	455, random_ RF trap: False, cla : 1, min_samp hbors: 8, rand	ADASYN ass_weight: balanced, coles_split: 5, n_estimatelom_state: 39, smo_gr	Over resampling criterion: gini, m ors: 20, name: F p: OVER, type:	0.991 ² hax_features: sqrt RF, random_state ADASYN}}
0.7923868 TPE {classifier min_samp 39}, sub:	37179554 39 : {bootst	455, random_ RF trap: False, cla : 1, min_samp	ADASYN ass_weight: balanced, colles_split: 5, n_estimate	Over resampling criterion: gini, mors: 20, name: Fp: OVER, type:	0.991 ² hax_features: sqrt RF, random_state ADASYN}}
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TABLE S-14 "VEHICLE1" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	SVM	SMOTENC	Over	0.8305
Grid	18	SVM	RandomOverSampler	resampling Over	0.8355
Grid	27	SVM	BorderlineSMOTE	resampling Over	0.8376
Grid	29	SVM	BorderlineSMOTE	resampling	0.8348
				Over resampling	
Grid	36	SVM	ADASYN	Over resampling	0.83
Grid	39	SVM	ADASYN	Over resampling	0.835
Grid	59	SVM	SMOTE	Over resampling	0.8317
Grid	79	SVM	SMOTE	Over	0.8358
Grid	90	SVM	BorderlineSMOTE	resampling Over	0.8322
Grid	109	SVM	ADASYN	resampling Over	0.83
Random	9	SVM	ClusterCentroids	resampling Under	0.8307
	L	170 01 7722	410070 00 0	resampling	
			6419878, coef0: -0.466 0.5369190164853789, ke		
			nrinking: False, tol: 0.095		
			om_state: 9, smo_grp: Ul		
oting: ha					
Random	18	SVM	SMOTE	Over resampling	0.8443
classifier	: {C: 5.2	212351844781	1458, coef0: -0.21255140)24703299, degr	ee: 3. gamma:
			901892905, kernel: rbf, i		
			lse, tol: 0.042475683823		
			ER, type: SMOTE}}	<u> </u>	
Random	27	SVM	ADASYN	Over	0.8549
classifica	 	23074597047	 2635, coef0: 0.11334192	resampling	aar 2 gammar
			84805598337, kernel: p		
ty: False	, randor	n_state: 27,	shrinking: False, tol: 0	0.0245645962413	323945}, sub:
n_neight		andom_state:	27, smo_grp: OVER, ty		+
Random	29	SVM	SMOTE	Over	0.8536
classifier	. (C. 0.	 	 5629, coef0: 0.35674184	resampling	aa. A gamma.
			28370061, kernel: rbf, n		
			alse, tol: 0.02825631030		
, random		9, smo_grp:	OVER, type: SMOTE}}		
Random	36	SVM	BorderlineSMOTE	Over	0.8179
classifier	· {C· 45	81894195060	9051, coef0: -0.76127688	resampling 893150073 deer	ee. 3 gamma.
			168821291, kernel: rbf, r		
andom_s	tate: 36,	shrinking: F	alse, tol: 0.0436937710	7358044}, sub:	{k_neighbors:
	borderlir	ne-2, m_neigh	hbors: 4, random_state:		
		,,	To an alst that	TTd.	0.0000
Borderline		SVM	TomekLinks	Under	0.8288
Borderline	39	5 1112	1	recompling	
Borderline Random				resampling 094742264, degr	ee: 2, gamma
Borderline Random [classifier	 :: {C: 15'	 7.5458232668	37355, coef0: 0.95162790 4697658154, kernel: po	094742264, degr	
Borderline Random [classifier scale, gar False, rand	 : {C: 15' nma_val dom_stat	7.5458232668 ue: 2.500018 ee: 39, shrinkii	 	094742264, degr oly, name: SVM	1, probability:
Borderling Random [classifier scale, gar False, rand UNDER,	C: 15' mma_val dom_stat type: To	7.5458232668 ue: 2.500018 ee: 39, shrinkii mekLinks}}	 87355, coef0: 0.95162790 4697658154, kernel: pong: False, tol: 0.02516836	094742264, degr oly, name: SVM 60631658265}, s	I, probability: ub: {smo_grp:
Borderling Random [classifier scale, gar False, rand UNDER,	 : {C: 15' nma_val dom_stat	7.5458232668 ue: 2.500018 ee: 39, shrinkii	 	094742264, degr olly, name: SVN 60631658265}, s	1, probability:
Borderling Random Classifier scale, gar False, rand JNDER, Random	C: 15'mma_val dom_stat type: To	7.5458232668 ue: 2.500018 ee: 39, shrinkii mekLinks}}	 k7355, coef0: 0.95162790 4697658154, kernel: pc ng: False, tol: 0.02516836 SMOTETomek	094742264, degrolly, name: SVN 60631658265}, s	I, probability: sub: {smo_grp:
Borderling Random (classifier scale, gar False, rand UNDER, Random	:: {C: 15'mma_valdom_stat type: To 59	7.5458232668 ue: 2.500018 ee: 39, shrinkii mekLinks}} SVM		094742264, degroly, name: SVM 60631658265}, s Combine resampling 079914884, degro	1, probability: hub: {smo_grp: 0.8434 ee: 2, gamma:
Borderling Random Classifier scale, gar False, rand UNDER, Random classifier scale, gamerandom_s	:: {C: 15'mma_valdom_stattype: To 59 :: {C: 33mma_valutate: 59,	7.5458232668 ue: 2.500018 e: 39, shrinkii mekLinks}} SVM .78031236443 e: 2.1365158 shrinking: Fa	17355, coef0: 0.9516279(4697658154, kernel: pc ng: False, tol: 0.02516836 SMOTETomek SMOTETomek 5637, coef0: 0.74932650 62066533, kernel: poly, lalse, tol: 0.08240900514	O94742264, degroly, name: SVM O6631658265}, s Combine resampling O79914884, degroname: SVM, pro	1, probability: ub: {smo_grp: 0.8434 ee: 2, gamma: bability: True,
Borderling Random (classifier scale, gar False, rand UNDER, Random (classifier scale, gar random_s 59, smo_s	:: {C: 15'mma_valdom_stattype: To 59 :: {C: 33'mma_valutate: 59, grp: CON	7.5458232668 ue: 2.500018 e: 39, shrinkin mekLinks}} SVM 7.803123644: ue: 2.1365158 shrinking: Fa	17355, coef0: 0.9516279(14697658154, kernel: pt. ng: False, tol: 0.02516836 SMOTETomek	094742264, degrally, name: SVM, 00631658265}, s Combine resampling 179914884, degrame: SVM, pro 591198}, sub: {	1, probability: ub: {smo_grp: 0.8434 ee: 2, gamma: bability: True, random_state:
Borderling Random (classifier scale, gar False, rand UNDER, Random (classifier scale, gar random_s 59, smo_s	:: {C: 15'mma_valdom_stattype: To 59 :: {C: 33mma_valutate: 59,	7.5458232668 ue: 2.500018 e: 39, shrinkii mekLinks}} SVM .78031236443 e: 2.1365158 shrinking: Fa	17355, coef0: 0.9516279(4697658154, kernel: pc ng: False, tol: 0.02516836 SMOTETomek SMOTETomek 5637, coef0: 0.74932650 62066533, kernel: poly, lalse, tol: 0.08240900514	194742264, degroly, name: SVM, substituting 195914884, degramme: SVM, pro 591198}, sub: {	1, probability: ub: {smo_grp: 0.8434 ee: 2, gamma: bability: True,
Borderline Random (classifier scale, gar False, rane UNDER, Random (classifier scale, gar arandom_s 59, smo_{ Random	C: {C: 15'mma_valdom_stattype: To 59 C: {C: 33'mma_valdom_stattype: To 79 C: {C: 33'mma_valdotate: 59, grp: COM 79 C: {C: 35'mma_valdotate: 59, grp: COM 79 C: {C: 15'mma_valdotate: 50, grp: COM 79 C: {C: 15'mma_valdotate: 50, grp:	7.5458232668 ue: 2.500018 ue: 2.500018 ue: 39, shrinkin mekLinks}} SVM 7.803123644: ue: 2.1365158 shrinking: Fa MBINE, type: SVM		194742264, degroly, name: SVM 19631658265}, s Combine resampling 179914884, degroame: SVM, pro 1991198}, sub: {	1, probability: ub: {smo_grp: 0.8434 ee: 2, gamma: bability: True, random_state: 0.8565
Borderline Random (classifier scale, gar False, rane UNDER, Random (classifier scale, gar random_s 59, smo_{ Random} (classifier	: {C: 15' mma_val dom_stat type: To 59 : {C: 33 mma_val tate: 59, grp: COM 79 : {C: 7.8' conditions of the conditions of	7.5458232668 ue: 2.500018 ue: 39, shrinkin mekLinks}} SVM 7.7803123644: ue: 2.1365158 shrinking: Fa MBINE, type: SVM 301230781426	17355, coef0: 0.9516279(14697658154, kernel: pt. ng: False, tol: 0.02516836 SMOTETomek	D94742264, degroly, name: SVM 50631658265}, s Combine resampling 179914884, degroname: SVM, pro 591198}, sub: { Over resampling 143104519, degroup 143104519, degro	1, probability: ub: {smo_grp: 0.8434 ee: 2, gamma: bability: True, random_state: 0.8565 ee: 4, gamma:

continued of	on t	he 1	next	column
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Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	SVM	RandomOverSampler	Over	0.8372
Lelaccifier	· 1C· 25	30685350300	 0108, coef0: 0.089007503	resampling	e. 3 gamma:
			11795294, kernel: rbf, nan		
			se, tol: 0.04650273052001		
			OverSampler}}	,,	
Random	109	SVM	RandomOverSampler	Over	0.8614
				resampling	
			164, coef0: -0.7487563078		
			499259805, kernel: rbf, na True, tol: 0.0896424151226		
			ndomOverSampler}}	13690}, Sub. {1	andom_state.
TPE	9 9	SVM	OneSidedSelection	Under	0.874
	_			resampling	
			0022, coef0: 0.739934100		
			57826573305, kernel: po		
			shrinking: False, tol: 0.0		
{n_neight edSelectio		n_seeds_S: 1	7, random_state: 9, smo_g	rp: UNDER, t	ype: OneSia-
TPE	18	SVM	SMOTETomek	Combine	0.8612
II L	10	SVM	SWOTETOMER	resampling	0.0012
{classifier	: {C: 12.	76808550568	88656, coef0: -0.453770509		e: 2, gamma:
			17109982, kernel: rbf, nan		
			alse, tol: 0.0427143956622	?7483}, sub: {1	andom_state:
			SMOTETomek}}		0.000
TPE	27	SVM	SVMSMOTE	Over resampling	0.8609
{classifier	· {C· 5.7	<u> </u> 31166426675	 977, coef0: -0.2355891350		e: 4 gamma:
			57046763, kernel: rbf, nan		
			ie, tol: 0.048046998665046		
m_neighb	ors: 7, ou	ut_step: 0.046	782376043304104, random	_state: 27, smc	grp: OVER,
type: SVN					
TPE	29	SVM	RandomUnderSampler	Under	0.8603
(alassifian	. (C: 44	24709005691	 374, coef0: 0.8919317320	resampling	
			5626816293, kernel: poly		
			king: False, tol: 0.053546		
dom_state	: 29, rep	lacement: Fal	se, smo_grp: UNDER, typ	e: RandomUn	derSampler}}
TPE	36	SVM	BorderlineSMOTE	Over	0.8643
				resampling	
			9283, coef0: 0.828005570		
			97760765, kernel: poly, nai ue, tol: 0.00743652407721		
			abors: 7, random_state: 3		
Borderline				-, - = 5 1	, 51
TPE	39	SVM	ClusterCentroids	Under	0.8584
				resampling	
			876884, coef0: -0.21801		
			04766126969048, kernel: 1		
			ng: True, tol: 0.025631868 te: 39, smo_grp: UNDER,		
ing: hard}		s, randoni_sta	ic. 55, sino_grp. CIVDLK,	type. Clustere	cittoids, vot-
TPE	59	SVM	RandomUnderSampler	Under	0.8605
				resampling	
			388, coef0: 0.6845619484		
			8375882713, kernel: poly		
			king: True, tol: 0.011905		
TPE	: 59, rep	SVM	se, smo_grp: UNDER, typ RandomOverSampler	oe: RandomUno Over	0.8695
IFE	19	3 V IVI	Kanuomoversampier	resampling	0.8093
{classifier	: {C: 14.	61917925315	4758, coef0: 0.792310294		e: 2, gamma:
			301795583, kernel: rbf, na		
			ue, tol: 0.02418796488506	51877}, sub: {1	andom_state:
			domOverSampler}}		
TPE	90	SVM	SMOTE	Over	0.8836
(classifier	· (C· 5	30027026452	 945, coef0: 0.6846867406	resampling	. 3 gamma.
			62855092, kernel: poly, na		
			lse, tol: 0.09039808695136		
			ER, type: SMOTE}}	, , (K_	
TPE	109	SVM	ClusterCentroids	Under	0.8658
				resampling	
			0612, coef0: 0.533709386	5077166, degre	
			12412406, kernel: poly, nar		
			false, tol: 0.000387827640		
		s, random_sta	ite: 109, smo_grp: UNDI	⊵к, type: Clus	sterCentroids,
voting: so	11}}				

TABLE S-15 "VEHICLE3" - CONTINUED FROM PREVIOUS COLUMN

ClusterCentroids

Res.Group

Under

GM

0.8243

Resampler

MethodSeedClassifierRandom90SVM

			TABLE S-15			Random	90	SVM	ClusterCentroids	Under	0.8243
			"VEHICLE3"			(-1:6	. (C. 1	55 007 42 92 92 92	0506	resampling	
M (1 1	C	CI 10	D 1	D. C	CM				0506, coef0: 0.97985093 6936881, kernel: poly, n		
Method Grid	Seed 9	Classifier SVM	Resampler ADASYN	Res.Group Over	GM 0.8124				se, tol: 0.080167425899:		
Giiu	"	3 V IVI	ADASTN	resampling	0.8124				0, smo_grp: UNDER, t		
Grid	18	SVM	ADASYN	Over	0.8106	soft}}					
				resampling		Random	109	SVM	SMOTEENN	Combine	0.8278
Grid	27	SVM	RandomOverSampler	Over	0.8063	Sclassifier	1C. 6	 6.0709158997 <i>6</i>	 5159, coef0: 0.30388678	resampling	ee: 2 gamma:
Grid	29	SVM	BorderlineSMOTE	resampling Over	0.81				20030403, kernel: poly,		
Gilu	29	SVIVI	BoldelilleSMOTE	resampling	0.61		_		alse, tol: 0.01491577315	•	
Grid	36	SVM	SMOTE	Over	0.8137				:: SMOTEENN}}	•	. –
				resampling		TPE	9	SVM	ClusterCentroids	Under	0.8299
Grid	39	SVM	ADASYN	Over	0.8154	(1 'C	(0.1	(07102202207	1052 60 0.01410074	resampling	
Grid	59	SVM	ADASYN	resampling Over	0.8102				'053, coef0: -0.81419076 998003427, kernel: rb		
Gila	37	SVIVI	ADASTI.	resampling	0.0102	, ,	_		g: True, tol: 0.05098614	*	, 1
Grid	79	SVM	ADASYN	Over	0.8116				grp: UNDER, type: Clu		
				resampling		TPE	18	SVM	SMOTE	Over	0.8504
Grid	90	SVM	BorderlineSMOTE	Over	0.8116					resampling	
Grid	109	SVM	RandomOverSampler	resampling Over	0.8064				8374, coef0: 0.20050314		
Ond	107	3 7 171	randomoversampier	resampling	0.0001				59413083, kernel: poly, 1 dse, tol: 0.01959216941		
Random	9	SVM	SMOTE	Over	0.8211				OVER, type: SMOTE}}		(K_Heighbors.
				resampling		TPE	27	SVM	BorderlineSMOTE	Over	0.8525
			5117, coef0: 0.076251012							resampling	
, ,	_		74038563, kernel: poly, na e, tol: 0.02337524413256	, I					9544, coef0: 0.44119142		
			ER, type: SMOTE}}	2707 J, 3ub. (R	_neighbors. 0,				845094725867, kernel: shrinking: True, tol: 0		
Random		SVM	EditedNearest	Under	0.8238	1 -	*	_	line-1, m_neighbors: 7,		,,,
			Neighbours	resampling				derlineSMOTE		random_state.	27, SHO_grp.
			165, coef0: -0.53451759			TPE	29	SVM	SMOTEENN	Combine	0.8436
			258674072, kernel: rbf, na							resampling	
			rue, tol: 0.079910259303 ER, type: EditedNearestN		{Kiliu_sei: ali,				435, coef0: 0.79838528		
Random		SVM	ADASYN	Over	0.8353	, ,	_		7589195, kernel: poly, rulse, tol: 0.03135337218	, 1	
				resampling					SMOTEENN}}	5506405}, Sub.	{random_state.
			2635, coef0: 0.113341921			TPE	36	SVM	ADASYN	Over	0.8584
			34805598337, kernel: p							resampling	
			shrinking: False, tol: 0. 27, smo_grp: OVER, typ						8997, coef0: 0.24404828		
Random		SVM	RandomOverSampler	Over	0.8428				78523068, kernel: poly, 1		
Rundom	-	3 7 171	randomoversampler	resampling	0.0120	_			rue, tol: 0.096548027333 ER, type: ADASYN}}	13113}, sub: {	_neighbors: 2,
			8487, coef0: 0.51298619	26611614, degr		TPE	39	SVM	SMOTENC	Over	0.8513
			98164566, kernel: poly, na					~		resampling	
			lse, tol: 0.0299029652312	229/65}, sub:	{random_state:	,			7756, coef0: 0.68668222		
Random		SVM	domOverSampler}} SMOTE	Over	0.8039				3864904, kernel: poly, n		
Kandom	30	SVWI	SMOTE	resampling	0.8039				False, tol: 0.030529021		
{classifier	r: {C: 14	6.1565657904	602, coef0: 0.134051522		ree: 2, gamma:	TENC}}	es. 11u	e, k_neignbors	: 2, random_state: 39,	silio_gip. Over	x, type. SMO-
			66095489, kernel: poly, na			TPE	59	SVM	SMOTENC	Over	0.8472
			lse, tol: 0.0819451735370)4968}, sub: {k	_neighbors: 3,					resampling	
			ER, type: SMOTE}}	Hadan	0.0106				3345, coef0: 0.56477610		
Random	39	SVM	AllKNN	Under resampling	0.8186				595187864, kernel: pol		
{classifie	r: {C: 11	2.3594251704	0154, coef0: 0.95688159:		ree: 3, gamma:				king: True, tol: 0.0073: hbors: 9, random_state		
auto, gam	nma_valu	e: 2.44831701	0579557, kernel: poly, na	me: SVM, pro	bability: False,	SMOTEN		. ITuc, k_licig	noors. 9, random_state	. 59, smo_grp.	OVER, type.
			rue, tol: 0.041641397024			TPE	79	SVM	SMOTETomek	Combine	0.8471
			ors: 5, smo_grp: UNDER							resampling	
Random	59	SVM	SMOTEENN	Combine resampling	0.8248				996, coef0: 0.81461598		
{classifier	r: {C: 150	0.0700875091	4366, coef0: 0.119499546		ree: 2, gamma:				80332827, kernel: poly, r		
			66910008, kernel: poly, na						lse, tol: 0.004245236330 SMOTETomek}}	00/4242}, SUD:	(random_state:
random_s	state: 59,	shrinking: Fa	alse, tol: 0.058700803408			TPE	90	SVM	RandomOverSampler	Over	0.8592
			SMOTEENN}}							resampling	
Random	79	SVM	RandomOverSampler	Over	0.809				5895, coef0: 0.79132487	79955301, degi	
{classifier	r: {C· 7 9	L 301230781 <i>426</i>	 	resampling	ree: 4 gamma:				7441846, kernel: poly, n		
			42363991, kernel: rbf, na						rue, tol: 0.05762033375	939168}, sub:	{random_state:
, ,	_		lse, tol: 0.0369547616468	, 1		TPE	grp: Ov 109	SVM	domOverSampler}} ClusterCentroids	Under	0.8421
	~~ .				-	1112	109	1 N 1 V I	Ciustei Celluloius	Unuci	0.0421

continued on the next column

TABLE S-15

79, smo_grp: OVER, type: RandomOverSampler}}

{classifier		2 A IM	SMOTEENN	Combine	0.8430
{classifier				resampling	
	C: 89	.9966430284	435, coef0: 0.798385281	0397156, degr	ee: 2, gamma:
			17589195, kernel: poly, n		
			alse, tol: 0.031353372185		
			: SMOTEENN}}	, suo.	rundom_state.
					0.0504
TPE	36	SVM	ADASYN	Over	0.8584
				resampling	
			98997, coef0: 0.244048286		
auto, gami	ma_valu	e: 7.8791755'	78523068, kernel: poly, n	ame: SVM, pro	bability: True,
random_st	ate: 36,	shrinking: T	rue, tol: 0.096548027331	3113}, sub: {n	_neighbors: 2,
random st	ate: 36.	smo grp: OV	/ER, type: ADASYN}}		
TPE	39	SVM	SMOTENC	Over	0.8513
11.2		5 7 1.11	SMOTERIC	resampling	0.0515
Lalossifian	(C: 12	25944576607	77756, coef0: 0.68668222		
			3864904, kernel: poly, na		
			False, tol: 0.030529021		
cal_feature	es: True,	, k_neighbors	s: 2, random_state: 39, s	mo_grp: OVEF	R, type: SMO-
TENC}}					
TPE	59	SVM	SMOTENC	Over	0.8472
				resampling	
{classifier	{C: 17	43180944267	73345, coef0: 0.56477616		ree: 2. gamma:
			595187864, kernel: pol		
			king: True, tol: 0.00732		
		True, k_neig	ghbors: 9, random_state:	59, smo_grp:	OVER, type:
SMOTEN	,,				
TPE	79	SVM	SMOTETomek	Combine	0.8471
	1			resampling	
			1996, coef0: 0.814615983		
			1996, coef0: 0.814615983 80332827, kernel: poly, n		
scale, gam	ma_valu	ie: 7.3416873		ame: SVM, pro	bability: False,
scale, gam random_st	ma_valu ate: 79,	ie: 7.3416873 shrinking: Fa	80332827, kernel: poly, n dlse, tol: 0.004245236330	ame: SVM, pro	bability: False,
scale, gam random_st 79, smo_g	ma_valu ate: 79, grp: COM	ie: 7.3416873 shrinking: Fa MBINE, type:	80332827, kernel: poly, n dlse, tol: 0.0042452363300 : SMOTETomek}}	ame: SVM, pro 874242}, sub:	bability: False, random_state:
scale, gam random_st	ma_valu ate: 79,	ie: 7.3416873 shrinking: Fa	80332827, kernel: poly, n dlse, tol: 0.004245236330	ame: SVM, pro 874242}, sub:	bability: False, random_state:
scale, gam random_st 79, smo_g TPE	ma_valu ate: 79, rp: CON	e: 7.3416873 shrinking: Fa MBINE, type:	80332827, kernel: poly, n dlse, tol: 0.004245236330 : SMOTETomek}} RandomOverSampler	ame: SVM, pro 874242}, sub:	bability: False, random_state:
scale, gam random_st 79, smo_g TPE	ma_valu tate: 79, grp: CON 90	ie: 7.3416873 shrinking: Fa MBINE, type: SVM	80332827, kernel: poly, n llse, tol: 0.0042452363303 SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487	ame: SVM, pro 874242}, sub: Over resampling 79955301, degr	bability: False, random_state: 0.8592 ee: 2, gamma:
scale, gam random_st 79, smo_g TPE {classifier: auto, gami	ma_valu ate: 79, grp: COM 90 : {C: 6.9 ma_value	te: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844: e: 6.4798264	80332827, kernel: poly, n llse, tol: 0.004245236330 SMOTETomek}} RandomOverSampler 5895, coef0: 0.79132487' 47441846, kernel: poly, na	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False,
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st	ma_value tate: 79, grp: COM 90 : {C: 6.9 ma_value tate: 90,	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844: e: 6.4798264 shrinking: T	80332827, kernel: poly, n llse, tol: 0.004245236330 SMOTETomek}} RandomOverSampler 5895, coef0: 0.79132487 47441846, kernel: poly, na true, tol: 0.057620333759	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False,
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st 90, smo_g	ma_valurate: 79, grp: COM 90 : {C: 6.9 ma_valurate: 90, grp: OVE	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844. e: 6.4798264 shrinking: T ER, type: Ran	80332827, kernel: poly, n lse, tol: 0.004245236330 : SMOTETomek}} RandomOverSampler 5895, coef0: 0.79132487 47441846, kernel: poly, narue, tol: 0.057620333759 domOverSampler}}	Over resampling 79955301, degrame: SVM, pro 039168}, sub:	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False, random_state:
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st	ma_value tate: 79, grp: COM 90 : {C: 6.9 ma_value tate: 90,	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844: e: 6.4798264 shrinking: T	80332827, kernel: poly, n llse, tol: 0.004245236330 SMOTETomek}} RandomOverSampler 5895, coef0: 0.79132487 47441846, kernel: poly, na true, tol: 0.057620333759	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False, random_state:
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st 90, smo_g	ma_value ate: 79, grp: COM 90 E {C: 6.9 ma_value ate: 90, grp: OVE 109	ie: 7.3416873 shrinking: Fa MBINE, type: SVM D7729349844 e: 6.4798264 shrinking: T ER, type: Ran	80332827, kernel: poly, nulse, tol: 0.004245236330: SMOTETomek}} RandomOverSampler 5895, coef0: 0.79132487' 47441846, kernel: poly, narue, tol: 0.057620333759 domOverSampler}} ClusterCentroids	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 339168}, sub: Under resampling	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False, random_state: 0.8421
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st 90, smo_g	ma_value ate: 79, grp: COM 90 E {C: 6.9 ma_value ate: 90, grp: OVE 109	ie: 7.3416873 shrinking: Fa MBINE, type: SVM D7729349844 e: 6.4798264 shrinking: T ER, type: Ran	80332827, kernel: poly, n lse, tol: 0.004245236330 : SMOTETomek}} RandomOverSampler 5895, coef0: 0.79132487 47441846, kernel: poly, narue, tol: 0.057620333759 domOverSampler}}	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 339168}, sub: Under resampling	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False, random_state: 0.8421
scale, gam random_st 79, smo_g TPE {classifier: auto, gamn random_st 90, smo_g TPE {classifier:	ma_valu ate: 79, prp: COM 90 : {C: 6.9 ma_valu ate: 90, prp: OVE 109	e: 7.3416873 shrinking: Fa MBINE, type: SVM 97729349844: e: 6.4798264 shrinking: T ER, type: Ran SVM	80332827, kernel: poly, nulse, tol: 0.004245236330: SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487' 47441846, kernel: poly, nurse, tol: 0.0576203337594domOverSampler} ClusterCentroids 19476, coef0: 0.124646294	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 39168}, sub: Under resampling 443251601, deg	bability: False, random_state: 0.8592 ee: 2. gamma: bability: False, random_state: 0.8421 ree: 2. gamma:
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st 90, smo_g TPE {classifier: auto, gam	ma_valuate: 79, pp: COM 90	e: 7.3416873 shrinking: Fa MBINE, type: SVM 17729349844: e: 6.4798264 shrinking: T ER, type: Ran SVM 1.6020324644 e: 7.6145996:	80332827, kernel: poly, nulse, tol: 0.004245236330: SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487' 47441846, kernel: poly, nurue, tol: 0.057620333759 ddomOverSampler} ClusterCentroids 19476, coef0: 0.124646294 23435601, kernel: poly, nurue, tol: 0.057620333759	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 39168}, sub: Under resampling 443251601, degrame: SVM, pro	bability: False, (random_state: 0.8592 ee: 2, gamma: bability: False, (random_state: 0.8421 ree: 2, gamma: bability: True,
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st 90, smo_g TPE {classifier: auto, gam random_st	ma_valuate: 79, pp: COM 90	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844. e: 6.4798264- shrinking: T ER, type: Ran SVM 1.6020324644 e: 7.6145996.	80332827, kernel: poly, n ulse, tol: 0.004245236330; SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487; 47441846, kernel: poly, n; rue, tol: 0.057620333755; domOverSampler} ClusterCentroids 19476, coef0: 0.12464629; 23435601, kernel: poly, n True, tol: 0.063482892	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 939168}, sub: Under resampling 143251601, degrame: SVM, pro 50381968}, su	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False, (random_state: 0.8421 ree: 2, gamma: bability: True, testimator: (estimator:
scale, gam random_st 79, smo_g TPE {classifier: auto, gamr random_st {classifier: auto, gamr auto, gamr the first first first first auto, gamr random_st MiniBatch	ma_valutate: 79, pp: CON 90 : {C: 6.9 ma_valutate: 90, pp: OVE 109 : {C: 174 ma_valutate: 109 kMeans	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844. e: 6.4798264- shrinking: T ER, type: Ran SVM 1.6020324644 e: 7.6145996.	80332827, kernel: poly, nulse, tol: 0.004245236330: SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487' 47441846, kernel: poly, nurue, tol: 0.057620333759 ddomOverSampler} ClusterCentroids 19476, coef0: 0.124646294 23435601, kernel: poly, nurue, tol: 0.057620333759	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 939168}, sub: Under resampling 143251601, degrame: SVM, pro 50381968}, su	bability: False, (random_state: 0.8592 ee: 2, gamma: bability: False, (random_state: 0.8421 ree: 2, gamma: bability: True, b: (estimator:
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st 90, smo_g TPE {classifier: auto, gam random_st	ma_valutate: 79, pp: CON 90 : {C: 6.9 ma_valutate: 90, pp: OVE 109 : {C: 174 ma_valutate: 109 kMeans	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844. e: 6.4798264- shrinking: T ER, type: Ran SVM 1.6020324644 e: 7.6145996.	80332827, kernel: poly, n ulse, tol: 0.004245236330; SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487; 47441846, kernel: poly, n; rue, tol: 0.057620333755; domOverSampler} ClusterCentroids 19476, coef0: 0.12464629; 23435601, kernel: poly, n True, tol: 0.063482892	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 939168}, sub: Under resampling 143251601, degrame: SVM, pro 50381968}, su	bability: False, (random_state: 0.8592 ee: 2, gamma: bability: False, (random_state: 0.8421 ree: 2, gamma: bability: True, b: (estimator:
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st {classifier: auto, gam random_st MiniBatch	ma_valutate: 79, pp: CON 90 : {C: 6.9 ma_valutate: 90, pp: OVE 109 : {C: 174 ma_valutate: 109 kMeans	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844. e: 6.4798264- shrinking: T ER, type: Ran SVM 1.6020324644 e: 7.6145996.	80332827, kernel: poly, n ulse, tol: 0.004245236330; SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487; 47441846, kernel: poly, n; rue, tol: 0.057620333755; domOverSampler} ClusterCentroids 19476, coef0: 0.12464629; 23435601, kernel: poly, n True, tol: 0.063482892	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 939168}, sub: Under resampling 143251601, degrame: SVM, pro 50381968}, su	bability: False, (random_state: 0.8592 ee: 2, gamma: bability: False, (random_state: 0.8421 ree: 2, gamma: bability: True, b: (estimator:
scale, gam random_st 79, smo_g TPE {classifier: auto, gam random_st {classifier: auto, gam random_st MiniBatch	ma_valutate: 79, pp: CON 90 : {C: 6.9 ma_valutate: 90, pp: OVE 109 : {C: 174 ma_valutate: 109 kMeans	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844. e: 6.4798264- shrinking: T ER, type: Ran SVM 1.6020324644 e: 7.6145996.	80332827, kernel: poly, n ulse, tol: 0.004245236330; SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487; 47441846, kernel: poly, n; rue, tol: 0.057620333755; domOverSampler} ClusterCentroids 19476, coef0: 0.12464629; 23435601, kernel: poly, n True, tol: 0.063482892	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 939168}, sub: Under resampling 143251601, degrame: SVM, pro 50381968}, su	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False, (random_state: 0.8421 ree: 2, gamma: bability: True, testimator: (estimator:
scale, gam random_st 79, smo_g TPE {classifier: auto, gami random_st {classifier: auto, gami auto, gami auto, gami filessifier: auto, gami auto, gami	ma_valutate: 79, pp: CON 90 : {C: 6.9 ma_valutate: 90, pp: OVE 109 : {C: 174 ma_valutate: 109 kMeans	e: 7.3416873 shrinking: Fa MBINE, type: SVM 07729349844. e: 6.4798264- shrinking: T ER, type: Ran SVM 1.6020324644 e: 7.6145996.	80332827, kernel: poly, n ulse, tol: 0.004245236330; SMOTETomek} RandomOverSampler 5895, coef0: 0.79132487; 47441846, kernel: poly, n; rue, tol: 0.057620333755; domOverSampler} ClusterCentroids 19476, coef0: 0.12464629; 23435601, kernel: poly, n True, tol: 0.063482892	ame: SVM, pro 874242}, sub: Over resampling 79955301, degrame: SVM, pro 939168}, sub: Under resampling 143251601, degrame: SVM, pro 50381968}, su	bability: False, random_state: 0.8592 ee: 2, gamma: bability: False, (random_state: 0.8421 ree: 2, gamma: bability: True, testimator: (estimator:

TABLE S-16 "GLASS-0-1-2-3_VS_4-5-6"

Method Seed Classifier Resampler Res.Group GM RepeatedEdited 0.9467 Grid DT Under NearestNeighbours resampling RF 0.953 18 Grid RandomUnderSampler Under resampling Grid 27 DT EditedNearest 0.953 Under Neighbours resampling Grid 29 RF RandomUnderSampler Under 0.953 resampling DT RepeatedEdited 0.9364 Grid Under resampling NearestNeighbours DT Grid 39 SMOTEENN Combine 0.953 resampling DT 59 SMOTEENN Combine 0.9429 Grid resampling 79 RF RepeatedEdited 0.9498 Grid Under NearestNeighbours resampling Grid 90 RF 0.9465 RandomUnderSampler Under resampling Grid 109 SVM ADASYN 0.9489 Over resampling Random RF Instance Under 0.9432 HardnessThreshold resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: entropy, max_features: log2, min_samples_leaf: 12, min_samples_split: 4, n_estimators: 88, name: RF, random_state: 9}, sub: {cv: 5, estimator: decision-tree, random_state: 9, smo_grp: UN-DER, type: InstanceHardnessThreshold}} ADASYN Random Over

resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: gini, max_features: 1, min_samples_leaf: 10, min_samples_split: 7, n_estimators: 104, name: RF, random_state: 18}, sub: {n_neighbors: 5, random_state: 18, smo_grp: OVER, type:

ADASYN}} RF ADASYN Over Random resampling

{classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: 1, min_samples_leaf: 14, min_samples_split: 12, n_estimators: 87, name: RF, random_state: 27}, sub: {n_neighbors: 9, random_state: 27, smo_grp: OVER, type: ADASYN}}

AllKNN

RF

Random

resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: entropy, max_features: 1, min_samples_leaf: 1, min_samples_split: 2, n_estimators: 17, name: RF, ran-

Under

dom_state: 29}, sub: {allow_minority: False, kind_sel: all, n_neighbors: 16, smo_grp: UNDER, type: AllKNN}} BorderlineSMOTE Over Random resampling

{classifier: {bootstrap: True, class_weight: balanced, criterion: gini, max_features: 1, min_samples_leaf: 5, min_samples_split: 9, n_estimators: 115, name: RF, random_state: 36}, sub: {k_neighbors: 4, kind: borderline-2, m_neighbors: 9, random_state: 36, smo_grp: OVER, type: BorderlineSMOTE}}
Random | 39 | RF | ADASYN | 0

0.9421 Over resampling

{classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: 1, min_samples_leaf: 4, min_samples_split: 9, n_estimators: 120, name: RF, random_state: 39}, sub: {n_neighbors: 7, random_state: 39, smo_grp: OVER, type: ADASYN}}

RepeatedEdited Under 0.9465 RF Random 59 NearestNeighbours resampling

{classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: entropy, max_features: sqrt, min_samples_leaf: 7, min_samples_split: 4, n_estimators: 104, name: RF, random_state: 59}, sub: {kind_sel: all, n_neighbors: 5, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}}

ADASYN Random RF Over resampling

{classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: 1, min_samples_leaf: 3, min_samples_split: 19, n_estimators: 149, name: RF, random_state: 79}, sub: {n_neighbors: 7, random_state: 79, smo_grp: OVER, type: ADASYN}}

continued on the next column

TABLE S-16 "GLASS-0-1-2-3_VS_4-5-6" - CONTINUED FROM PREVIOUS COLUMN

Random	Seed	Classifier	Resampler	Res.Group	GM
random	90	RF	ADASYN	Over	0.953
			L	resampling	<u> </u>
{classifier:			class_weight: balance		
			es_leaf: 6, min_samp		
		_state: 90}, su	b: {n_neighbors: 7, rar	ndom_state: 90,	smo_grp: OVER
type: ADA Random	109	RF	CondensedNearest	Under	0.9588
Kandoni	109	KI	Neighbour	resampling	0.9360
{classifier:	{boots	strap: True,	class_weight: balance		criterion: gini
			leaf: 1, min_samples_		
			{n_neighbors: 22, n_s		ndom_state: 109
			nsedNearestNeighbou		
TPE	9	RF	SVMSMOTE	Over	0.9498
[classifier	Shootet	tran: Falsa el	 ass_weight: None, cri	resampling	ov fasturac: cart
			imples_split: 4, n_es		
			rs: 2, m_neighbors: 9,		
			ER, type: SVMSMOTI		. 500 1052 1, 02, 5
TPE	18	RF	AllKNN	Under	0.9498
				resampling	
			ass_weight: balanced,		
			samples_split: 10, n_o		
			inority: True, kind_se	i: aii, n_neighb	oors: 9, smo_grp
UNDER, t	27	RF	ADASYN	Over	0.962
	21	131	110/10/11	resampling	0.902
{classifier:	{boots	trap: False. o	class_weight: balanced		riterion: entropy
			leaf: 5, min_samples_:		
RF, randor	n_state:	27}, sub: {n_	neighbors: 8, random_	state: 27, smo_	grp: OVER, type
ADASYN					
TPE	29	RF	BorderlineSMOTE	Over	0.9594
(-1:6	(1		1	resampling	·
			lass_weight: balanced samples_split: 4, n_es		
			hbors: 7, kind: bord		
			, type: BorderlineSMO		-8
TPE	36	RF	ADASYN	Over	0.9626
				resampling	
	{ hoote		lass_weight: balanced		
			samples_split: 10, n_c		
1, min_sa	mples_le				
1, min_sa dom_state:	mples_le: 36}, s		nbors: 5, random_stat	te: 36, smo_gr	p. OVER, type
1, min_sa dom_state: ADASYN	mples_le : 36}, s }}	sub: {n_neigh	nbors: 5, random_stat		
1, min_sa dom_state: ADASYN	mples_le: 36}, s			Combine	
1, min_sa dom_state: ADASYN TPE	mples_le: 36}, s }} 39	sub: {n_neigh	nbors: 5, random_stat	Combine resampling	0.953
1, min_sa dom_state: ADASYN TPE {classifier: min_samp}	mples_lear: 36}, s }} 39 {bootst les_lear:	RF trap: False, cla 2, min_samp	SMOTEENN ass_weight: None, crit les_split: 3, n_estimate	Combine resampling erion: gini, mar ors: 21, name: F	0.953 x_features: None RF, random_state
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub:	mples_le : 36}, s }} 39 {bootst les_leaf: {random	RF trap: False, cla 2, min_samp n_state: 39, sn	SMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty	Combine resampling erion: gini, mar ors: 21, name: F	0.953 x_features: None RF, random_state NN}}
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub:	mples_lear: 36}, s }} 39 {bootst les_lear:	RF trap: False, cla 2, min_samp	SMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest	Combine resampling erion: gini, mayors: 21, name: Fype: SMOTEEN Under	0.953 x_features: None RF, random_state NN}}
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub:	mples_le: 36}, s }} 39 { {bootst les_leaf: {random 59}	RF trap: False, classical state: 39, sn RF	SMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour	Combine resampling erion: gini, mar ors: 21, name: F ype: SMOTEEN Under resampling	0.952 x_features: None RF, random_state VN}}
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier:	mples_le: 36}, s }} 39 {bootst les_leaf: {random 59 {boots}	RF trap: False, cla 2, min_samp n_state: 39, sn RF strap: True, c	ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balanced	Combine resampling erion: gini, may ors: 21, name: Fype: SMOTEEN Under resampling L_subsample, c	0.953 x_features: None RF, random_state NN} 0.9592 riterion: entropy
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu	mples_ld: 36}, s }} 39 {bootst les_leaf: {random 59 {bootst res: log	RF trap: False, clr 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp	sMOTEENN ass_weight: None, crit les_split: 3, n_estimato no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balancec les_leaf: 1, min_samp	Combine resampling erion: gini, may ors: 21, name: Fype: SMOTEN Under resampling 1_subsample, colles_split: 9, n	0.953 x_features: None RF, random_state NN} 0.9594 riterion: entropy _estimators: 134
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF,	mples_los : 36}, s }} 39 { {bootst les_leaf: {random 59 { {boots res: log random	RF trap: False, cl. 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp _state: 59}, s	ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balanced	Combine resampling erion: gini, manors: 21, name: Fype: SMOTEEN Under resampling I_subsample, coles_split: 9, n_seeds_S: 46, r	0.953 x_features: None RF, random_state NN} 0.9594 riterion: entropy _estimators: 134
I, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp:	mples_los : 36}, s }} 39 { {bootst les_leaf: {random 59 { {boots res: log random	RF trap: False, cl. 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp _state: 59}, s	sMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour llass_weight: balancec les_leaf: 1, min_samp ub: {n_neighbors: 2, n	Combine resampling erion: gini, mayors: 21, name: Fype: SMOTEEN Under resampling l_subsample, c oles_split: 9, n, seeds_S: 46, rr}	0.953 x_features: None RF, random_state NN} 0.9594 riterion: entropy _estimators: 134 andom_state: 59
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE	mples_loss 36}, ss }} 39 {bootst les_leaf: {random 59 {bootst res: log random UNDER 79	RF trap: False, cl. 2, min_samp _state: 39, sn RF trap: True, c 2, min_samp _state: 59}, s t, type: Conde	SMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balancec les_leaf: 1, min_sampub: {n_neighbors: 2, nensedNearestNeighbou} SMOTEENN	Combine resampling erion: gini, mayors: 21, name: Fype: SMOTEEN Under resampling Lsubsample, coles_split: 9, n_seeds_S: 46, rr}} Combine resampling	0.953 x_features: None RF, random_state NN} 0.9594 riterion: entropy _estimators: 134 random_state: 59
1, min_sa dom_state ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier:	mples_ld: 36}, s }} 39 { bootst les_leaf: {random 59 { bootst res: log random UNDER 79 { criter	RF trap: False, cl. 2, min_samp n_state: 39, sn RF trap: True, c 2, min_sampi state: 59}, s type: Conde	sMOTEENN ass_weight: None, crit les_split: 3, n_estimato no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balancec les_leaf: 1, min_sampub: {n_neighbors: 2, n nsedNearestNeighbour SMOTEENN x_depth: 12, max_fe:	Combine resampling erion: gini, may ors: 21, name: F ype: SMOTEEN Under resampling L subsample, c oles_split: 9, n L seeds_S: 46, r r) Combine resampling atures: log2, m	0.953 x_features: None RF, random_state N}} 0.9592 riterion: entropy _estimators: 134 random_state: 59 0.9523
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sar	mples_ld: 36}, s }} 39 {bootst les_leaf: {random 59 {bootsr res: log random UNDER 79 {criter mples_s	RF trap: False, cl: 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp trap: True, c 2,	SMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balancee les_leaf: 1, min_samp ub: {n_neighbors: 2, n ensedNearestNeighbour SMOTEENN ix_depth: 12, max_fe e: DTC, random_state	Combine resampling erion: gini, may ors: 21, name: F ype: SMOTEEN Under resampling L subsample, c oles_split: 9, n L seeds_S: 46, r r) Combine resampling atures: log2, m	0.953 x_features: None RF, random_state N}} 0.9592 riterion: entropy _estimators: 134 random_state: 59 0.9523
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sa smo_grp:	mples_ld: 36}, s }} 39 {bootst les_leaf: {random 59 {bootsr res: log random UNDER 79 {criter mples_s COMBI	RF trap: False, cl: 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp cstate: 59}, s trap: Conde DT ion: gini, ma plit: 17, nam NE, type: SM	sMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour llass_weight: balancec tes_leaf: 1, min_samp ub: {n_neighbors: 2, n nneedNearestNeighbour SMOTEENN x_depth: 12, max_fee : DTC, random_state OTEENN}	Combine resampling erion: gini, manors: 21, name: Fype: SMOTEEN Under resampling 1-subsample, coles_split: 9, n_seeds_S: 46, rr} Combine resampling atures: log2, me: 79}, sub: {manorized from the resampling atures}, sub: {manorized from the resampling atures}, sub: {manorized	0.952 x_features: None RF, random_state NN} 0.9592 riterion: entropy _estimators: 134 andom_state: 59 0.9529 iin_samples_leaf andom_state: 79
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sa smo_grp:	mples_ld: 36}, s }} 39 {bootst les_leaf: {random 59 {bootsr res: log random UNDER 79 {criter mples_s	RF trap: False, cl: 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp trap: True, c 2,	SMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balancee les_leaf: 1, min_samp ub: {n_neighbors: 2, n ensedNearestNeighbour SMOTEENN ix_depth: 12, max_fe e: DTC, random_state	Combine resampling erion: gini, mayors: 21, name: Fype: SMOTEEN Under resampling _subsample, coles_split: 9, n_seeds_S: 46, rr}} Combine resampling atures: log2, rr erior; log2, rr	0.952 x_features: None RF, random_state NN} 0.9592 riterion: entropy _estimators: 134 andom_state: 59 0.9529 iin_samples_leaf andom_state: 79
1, min_sa dom_state ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sa smo_grp: TPE	mples_le: 36}, s }} 39 {bootst les_leaf: {random 59 {bootsr res: log random UNDER 79 {criter mples_s; COMBI 90	RF trap: False, cla 2, min_samp _state: 39, sn RF trap: True, c 2, min_samp _state: 59}, s t, type: Conde DT ion: gini, ma plit: 17, nam NE, type: SM RF	sMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balancec les_leaf: 1, min_samp ub: {n_neighbors: 2, n} ensedNearestNeighbou SMOTEENN x_depth: 12, max_fer er: DTC, random_state OTEENN} ADASYN	Combine resampling erion: gini, mayors: 21, name: Fype: SMOTEEN Under resampling subsample, coles_split: 9, nuseeds_S: 46, rr} Combine resampling atures: log2, rr: 79}, sub: {r.	0.953 x_features: None RF, random_state N} 0.9594 riterion: entropy _estimators: 134 random_state: 59 0.9523 nin_samples_leaf andom_state: 79 0.9593
1, min_sa dom_state: ADASYN TPE {classifier: mmin_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sa smo_grp: TPE {classifier:	mples_les: 36}, s }} 39 { bootst les_leaf: {random 59 { bootst res: log random UNDER 79 { criter mples_s COMBI 90 { bootst }	RF trap: False, cla 2, min_samp n_state: 39, sn RF trap: True, c 2, min_sampi state: 59}, s type: Conde DT ion: gini, ma plit: 17, nam NE, type: SM RF trap: True, cla	sMOTEENN ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour llass_weight: balancec tes_leaf: 1, min_samp ub: {n_neighbors: 2, n nneedNearestNeighbour SMOTEENN x_depth: 12, max_fee : DTC, random_state OTEENN}	Combine resampling erion: gini, manors: 21, name: Fype: SMOTEEN Under resampling Lsubsample, coles_split: 9, nseeds_S: 46, rr} Combine resampling atures: log2, rr exampling atures: log2, rr exampling criterion: entrol	0.953 x_features: None RF, random_state N} 0.9592 riterion: entropy _estimators: 134 random_state: 59 0.9523 nin_samples_leaf andom_state: 79 0.9595
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sa smo_grp: TPE {classifier: 1, min_sa froggr: TPE {classifier: 1, min_sa froggr: TPE {classifier: 1, min_sa froggr: TPE {classifier:	mples_ld: 36}, s }} 39 {bootst les_leaf: {random 59 {boots res: log random UNDER 79 {criter mples_s COMBI 90 {bootst mples_ld:	RF trap: False, cl: 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp i.state: 59, s trap: Conde DT ion: gini, ma plit: 17, nam NE, type: SM RF trap: True, cla eaf: 4, min_	smotes 5, random_state smotes None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balanced les_leaf: 1, min_samp ub: {n_neighbors: 2, neighbors: 2, neighbour Smotesn smotesn	Combine resampling erion: gini, manors: 21, name: Fype: SMOTEEN Under resampling Isubsample, coles_split: 9, n, seeds_S: 46, rr} Combine resampling attures: log2, rr erion: 79}, sub: {r. Over resampling criterion: entropestimators: 25,	0.953 x_features: None RF, random_state NN} 0.9594 riterion: entropy _estimators: 134 random_state: 59 0.9529 nin_samples_leaf andom_state: 79 0.9595 py, max_features name: RF, ran
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sa smo_grp: TPE {classifier: 1, min_sa froggr: TPE {classifier: 1, min_sa froggr: TPE {classifier: 1, min_sa froggr: TPE {classifier:	mples_ld: 36}, s }} 39 { bootst les_leaf: {random 59 { bootst res: log random UNDER 79 { criter mples_s COMBL 90 { bootst mples_li : 90}, s	RF trap: False, cla 2, min_samp _state: 39, sn RF trap: True, c 2, min_sampi _state: 59}, s t, type: Conde DT ion: gini, ma plit: 17, nam NE, type: SM RF trap: True, cla eaf: 4, min_ sub: {n_neighters}	smotesn 5, random_state smotesn 1, random_state ass_weight: None, crit les_split: 3, n_estimate no_grp: COMBINE, ty CondensedNearest Neighbour lass_weight: balanced les_leaf: 1, min_samp ub: {n_neighbors: 2, n nesdNearestNeighbour SMOTEENN smotesn 1, max_fe e: DTC, random_state OTEENN}} ADASYN loss_weight: balanced, samples_split: 4, n_e labors: 3, random_state	Combine resampling erion: gini, may ors: 21, name: Fupe: SMOTEEN Under resampling L subsample, coles_split: 9, nuseeds_S: 46, rur} Combine resampling atures: log2, rur: 79}, sub: {ruresampling criterion: entrop estimators: 25, te: 90, smo_gri	0.953 x_features: None RF, random_state N} 0.9594 riterion: entropy _estimators: 134 random_state: 59 0.9529 iin_samples_leaf andom_state: 79 0.9599; py, max_features name: RF, ran p: OVER, type
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu max_featu max_featu featu max_featu max_featu featu max_featu featu max_featu featu max_featu featusfier: 1, min_sa dom_state ADASYN	mples_ld: 36}, s }} 39 { bootst les_leaf: {random 59 { bootst res: log random UNDER 79 { criter mples_s COMBL 90 { bootst mples_li : 90}, s	RF trap: False, cl: 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp i.state: 59, s trap: Conde DT ion: gini, ma plit: 17, nam NE, type: SM RF trap: True, cla eaf: 4, min_	smoteens smotee	Combine resampling erion: gini, may ors: 21, name: Fupe: SMOTEEN Under resampling d_subsample, colles_split: 9, nu_seeds_S: 46, rury] Combine resampling attures: log2, rury; roys, sub: {ruresampling criterion: entropstimators: 25, te: 90, smo_griconterion: combine combine resampling criterion: entropstimators: 25, te: 90, smo_griconterion: combine	0.953 x_features: None RF, random_state N} 0.9594 riterion: entropy _estimators: 134 random_state: 59 0.9529 iin_samples_leaf andom_state: 79 0.9599; py, max_features name: RF, ran p: OVER, type
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sa smo_grp: TPE {classifier: 1, min_sa dom_state: ADASYN TPE	mples_ld: 36}, s }} 39 {bootst les_leaf: {random 59 {bootst res: log random UNDER 79 {criter mples_s COMBI 90 {bootst mples_ld: 90}, s }} 109	RF trap: False, cl: 2, min_samp n_state: 39, sn RF trap: True, c 2, min_samp istate: 59, s trap: True, c c	smoteens smotee	Combine resampling erion: gini, manors: 21, name: Fype: SMOTEEN Under resampling Lsubsample, coles_split: 9, nseeds_S: 46, if } Combine resampling atures: log2, if e: 79}, sub: {r. Over resampling criterion: entropestimators: 25, te: 90, smo_gr	0.953 x_features: None RF, random_state N}} 0.9592 riterion: entropy _estimators: 134 random_state: 59 0.9529 nin_samples_leaf andom_state: 79 0.9595 py, max_features name: RF, ran- p: OVER, type 0.9498
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu name: RF, smo_grp: TPE {classifier: 1, min_sa smo_grp: TPE {classifier: 1, min_sa dom_state: ADASYN TPE {classifier:	mples_ld: 36}, s }} 39 {bootst les_leaf: {random 59 {boots res: log random UNDER 79 {criter mples_s; COMBI 90 {bootst mples_ld: 90}, s }} 109 {bootst	RF trap: False, cla 2, min_samp _state: 39, sn RF trap: True, c 2, min_samp _state: 59}, sr _state: 59}, sr _state: 59, sr _type: Conde DT ion: gini, ma plit: 17, nam NE, type: SM RF trap: True, cla eaf: 4, min_ sub: {n_neigl} RF	smoteens smotee	Combine resampling erion: gini, mayors: 21, name: Fype: SMOTEEN Under resampling l_subsample, c oles_split: 9, n_seeds_S: 46, r r} Combine resampling atures: log2, rr e: 79}, sub: {r. Over resampling criterion: entropestimators: 25, te: 90, smo_gr Combine resampling Combine res	0.952 riterion: entropy estimators: 134 andom_state: 59 0.9522 nin_samples_leaf andom_state: 79 0.9595 0.9
1, min_sa dom_state: ADASYN TPE {classifier: min_samp 39}, sub: TPE {classifier: max_featu max_featu ng: fclassifier: 1, min_sa dom_state: ADASYN TPE {classifier: 1, min_sa dom_state: ADASYN TPE {classifier: 1, min_sa dom_state: ADASYN TPE {classifier: ADASYN TPE {	mples_ld: 36}, s }} 39 { bootst les_leaf: {random 59 { bootst res: log random UNDER 79 { criter mples_ls: 90 { bootst mples_ls: 90}, s }} 109 { bootst mples_ls:	RF trap: False, cla 2, min_samp _state: 39, sn RF trap: True, c 2, min_sampi _state: 59}, s t, type: Conde DT ion: gini, ma NE, type: SM RF trap: True, cla eaf: 4, min_sub: {n_neigle} RF trap: True, cla eaf: 4, min_sub: {n_neigle} RF	smoteens smotee	Combine resampling erion: gini, may ors: 21, name: Fupe: SMOTEEN Under resampling L subsample, coles_split: 9, nuseeds_S: 46, rur} Combine resampling attures: log2, rure: 79}, sub: {rure: 79}, sub: {rure: 79}, sub: {rure: 60, smo_grition: 61, s	0.952 x_features: None RF, random_state N} 0.9594 riterion: entropy _estimators: 134 andom_state: 59 0.9522 iin_samples_leaf andom_state: 79 0.9599; py, max_features name: RF, ran p: OVER, type 0.9490 riterion: entropy ators: 134, name

TABLE S-17 "VEHICLEO" - CONTINUED FROM PREVIOUS COLUMN

			TABLE S-17			Method	Seed	Classifier	Resampler	Res.Group	GM
			"VEHICLEO"			Random	90	SVM	OneSidedSelection	Under	0.9813
						{classifier	r: {C: 12	L.86633745640	1 12338, coef0: 0.55849437	resampling 61887837, deg	ree: 2, gamma:
Method	Seed	Classifier	Resampler	Res.Group	GM				06384249, kernel: rbf, na		
Grid	9	SVM	SMOTETomek	Combine resampling	0.978				<pre>ie, tol: 0.0175092582414 , smo_grp: UNDER, typ</pre>		
Grid	18	SVM	SMOTENC	Over resampling	0.9772	Random	109	SVM	RandomOverSampler	Over	0.9815
Grid	27	SVM	SMOTE	Over	0.9772				 0164, coef0: -0.74875630		
Grid	29	SVM	SMOTENC	resampling Over	0.9771				499259805, kernel: rbf, r		
Giid				resampling					True, tol: 0.08964241512 ndomOverSampler}}	265896}, sub:	{random_state:
Grid	36	SVM	SMOTENC	Over resampling	0.9779	TPE	9	SVM	SMOTENC	Over	0.9871
Grid	39	RF	ADASYN	Over resampling	0.9767	{classifier	:: {C: 12	 .76312911712	 2205, coef0: -0.62141159	resampling 929127139, deg	ree: 3, gamma:
Grid	59	SVM	SVMSMOTE	Over	0.9757				3989125405, kernel: rb		
				resampling					ng: False, tol: 0.0803722 s: 8, random_state: 9, s		
Grid	79	SVM	SMOTENC	Over resampling	0.978	TENC}}					
Grid	90	SVM	SMOTE	Over resampling	0.9756	TPE	18	SVM	SVMSMOTE	Over resampling	0.9888
Grid	109	SVM	SVMSMOTE	Over	0.9725				6516, coef0: -0.5451284		
D 1	9	CVIM	CMOTET1-	resampling	0.07(0				33918013, kernel: rbf, nalse, tol: 0.074165945771		
Random		SVM	SMOTETomek	Combine resampling	0.9769	m_neighb	ors: 3, o	out_step: 0.97	40428002835999, randor		
			3508, coef0: 0.6255693			type: SVI	MSMOT 27	E}} SVM	ClusterCentroids	Under	0.9856
, ,	_		90506937, kernel: rbf, n e, tol: 0.05964793917983	, 1		IIL	21	3 7 171	ClusterCentrolus	resampling	0.9830
		NE, type: SM		200), 540. (14	indom_state. >,				5766, coef0: 0.81472021		
Random	18	SVM	CondensedNearest	Under	0.9808				81506767, kernel: rbf, n ue, tol: 0.0488778857458		
{classifier	 r: {C: 65	80453124133	Neighbour 3993, coef0: 0.66325651	resampling	ree: 2 gamma:				7, smo_grp: UNDER, ty		
			79497578, kernel: rbf, n			soft}}					
random_s	state: 18,	shrinking: Fa	lse, tol: 0.035491730744	78728}, sub: {r	n_neighbors: 4,	TPE	29	SVM	SVMSMOTE	Over	0.9872
	S: 25, ra	ndom_state: 1	8, smo_grp: UNDER, t	ype: Condensed	lNearestNeigh-	{classifier	: {C: 40	 35299010232	 25165, coef0: 0.48157863	resampling	ree: 3 gamma:
bour}} Random	27	SVM	ClusterCentroids	Under	0.9848				97585807, kernel: rbf, na		
				resampling					rue, tol: 0.092081979708		
			0797, coef0: -0.9997291			type: SVI			1486754392182, randon	1_state: 29, sm	o_grp: Ovek,
			085754417, kernel: rbf, 1 1e, tol: 0.0044509789575			TPE	36	SVM	RandomOverSampler	Over	0.9856
_			7, smo_grp: UNDER, t			(1 12				resampling	L
soft}}	1.00	CVD	GN COMP		0.0021				3273, coef0: 0.83504925 554113076, kernel: rbf, n		
Random	29	SVM	SMOTE	Over resampling	0.9821				ue, tol: 0.0701465190169		
{classifier	r: {C: 9.	37833475882	5629, coef0: 0.35674184		ree: 4, gamma:	smo_grp:	OVER,	type: Randon	OverSampler}}		
			28370061, kernel: rbf, n			TPE	39	SVM	SVMSMOTE	Over	0.985
			dlse, tol: 0.02825631030 OVER, type: SMOTE}}	1937922}, sub:	{k_neighbors:	{classifier	: {C: 9.	.88074278896	1 3122, coef0: 0.64498609	resampling 00992779, degr	ee: 2. gamma:
Random		SVM	TomekLinks	Under	0.9796	auto, gam	ımà_valu	ie: 1.2120439	727350187, kernel: rbf, n	ame: SVM, pro	obability: True,
				resampling					lse, tol: 0.078606103036		
			156, coef0: -0.29982973			m_neighb		- 1	01939587869904, randor	n_state: 39, sm	io_grp: OVER,
			56592814, kernel: rbf, r True, tol: 0.022034983			TPE	59	SVM	TomekLinks	Under	0.9854
		mekLinks}}	, 5.022057905		grp.					resampling	
Random	39	SVM	KMeansSMOTE	Over resampling	0.9798				3937, coef0: 0.47377636 0207496233, kernel: po		
{classifier	r: {C: 1.8	398211931388	5093, coef0: 0.5712153:		ree: 3, gamma:	True, rand	dom_stat	te: 59, shrinki	ng: True, tol: 0.0841559		
			187206937, kernel: po			UNDER, TPE	type: To	omekLinks}} SVM	CVMCMOTE	Over	0.9857
	_		king: True, tol: 0.0739 620690221785, k_neig			IPE	/9	SVIVI	SVMSMOTE	Over resampling	0.9857
		type: KMeans		110018. 2, 14110	ioni_state. 39,	{classifier	:: {C: 10	.44022487009	4994, coef0: -0.87267254		ree: 3, gamma:
Random	59	SVM	TomekLinks	Under	0.9788		_		59180909, kernel: rbf, n		
(al'C	(C: 20	46200702227	6015 ancf0: 0.12042270	resampling	man 2	_		_	lse, tol: 0.073527941144 276747379503774, rando		
			6915, coef0: 0.13042270 54551295, kernel: rbf, n			type: SVI			., 0, 7, 5, 7, 505 / 14, 1dllu0	state. 13, SII	io_gip. Over,
			rue, tol: 0.062965392134			TPE	90	SVM	SVMSMOTE	Over	0.989
DER, typ	e: Tomel	kLinks}}				(alcosif-	" (C: 2)	1.5499040200	2220 apof0: 0.02649166	resampling	ran: 1 gamma-:
Random	79	SVM	RandomOverSampler	Over	0.9831				2339, coef0: 0.93648166 26297078, kernel: rbf, na		
{classifier	r: {C: 75	1 80123078142 <i>6</i>	 	resampling 443104519, degr	ree: 4, gamma:				se, tol: 0.0001942575009		
			42363991 kernel rhf r						435568267562326, rando		

False, random_sta	ate: 39, shrin	king: True, tol: 0.07398	3227265014279	}, sub: {clus-	TPE	79	SVM	SVMSMOTE	Over	0.9857
ter_balance_thresh	nold: 0.38425	6620690221785, k_neigh	bors: 2, rand	om_state: 39,					resampling	
smo_grp: OVER,	type: KMeans	sSMOTE}}			· ·			4994, coef0: -0.87267254	, ,	, , ,
Random 59	SVM	TomekLinks	Under	0.9788	scale, gan	nma_valu	ie: 2.6325684	59180909, kernel: rbf, na	ame: SVM, pro	bability: True,
			resampling		random_s	tate: 79,	shrinking: Fal	lse, tol: 0.0735279411445	51866}, sub: {k	_neighbors: 6,
{classifier: {C: 28.	46398793327	6915, coef0: 0.130422705	80392157, deg	ree: 3, gamma:	m_neighb	ors: 3, ou	ut_step: 0.332	76747379503774, randor	n_state: 79, sm	o_grp: OVER,
auto, gamma valu	ie: 2.4075199	54551295, kernel: rbf, na	ame: SVM, pro	bability: True,	type: SVN	MSMOTE	Ξ}}			
random state: 59,	shrinking: Ti	rue, tol: 0.0629653921340	02995}, sub: {	smo grp: UN-	TPE	90	SVM	SVMSMOTE	Over	0.989
DER, type: Tomel	kLinks}}		,, ,	-C 1					resampling	
Random 79	SVM	RandomOverSampler	Over	0.9831	{classifier	: {C: 24	.54880492902	2339, coef0: 0.936481664	43111318, degr	ee: 4, gamma:
			resampling		auto, gam	ma_valu	e: 1.57303442	26297078, kernel: rbf, na	me: SVM, prol	bability: False,
{classifier: {C: 7.8	801230781426	841, coef0: -0.94017424		ree: 4, gamma:	random_s	tate: 90, s	shrinking: Fal	se, tol: 0.0001942575009	7002217}, sub:	{k_neighbors:
auto, gamma valu	ie: 7.9938127	42363991, kernel: rbf, na	ame: SVM, pro	bability: True,	9, m_neig	hbors: 5,	out_step: 0.5	435568267562326, rando	m_state: 90, sm	io_grp: OVER,
random_state: 79,	shrinking: Fa	lse, tol: 0.0369547616468	811204}, sub:	random_state:	type: SVN	MSMOTE	Ξ}}			
79, smo grp: OVI	ER, type: Ran	domOverSampler}}	**	` _	TPE	109	SVM	ClusterCentroids	Under	0.984
		<u> </u>	tinued on the	next column					resampling	
					{classifier	: {C: 21.	69848287760	1926, coef0: 0.56445523	91390437, degi	ree: 2, gamma:
					auto, gam	ma_value	e: 3.11229794	195459084, kernel: rbf, n	ame: SVM, pro	bability: True,
					random_s	tate: 109), shrinking:	False, tol: 0.079114128	80738587}, su	b: {estimator:
					KMeans,	random_:	state: 109, sm	io_grp: UNDER, type: Cl	usterCentroids,	voting: soft}}

TABLE S-18 "ECOLI1" – CONTINUED FROM PREVIOUS COLUMN

"ECOLI1" Classifier GM Method Seed Resampler Res.Group RF RepeatedEdited 0.904 Under NearestNeighbours resampling 0.8979 Grid 18 RF RepeatedEdited Under NearestNeighbours resampling Grid 27 RF RepeatedEdited 0.8979 Under NearestNeighbours resampling Grid RF 29 0.8979 RepeatedEdited Under NearestNeighbours resampling Grid 36 RF AllKNN 0.902 Under resampling 39 RF AllKNN 0.9 Grid Under resampling Grid 59 RF AllKNN Under 0.9 resampling Grid 79 RF RepeatedEdited Under 0.8979 NearestNeighbour resampling Grid 90 RF RepeatedEdited Under 0.8979 NearestNeighbours resampling RF 0.904 Grid 109 RepeatedEdited Under NearestNeighbour resampling RF 0.9015 Random TomekLinks Under resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: sqrt, min_samples_leaf: 16, min_samples_split: 18, n_estimators: 48, name: RF, random_state: 9}, sub: {smo_grp: UNDER, type: TomekLinks}} RF Random Neighbourhood Under CleaningRule resampling {classifier: {bootstrap: True, class_weight: None, criterion: gini, max_features: sqrt, min_samples_leaf: 10, min_samples_split: 6, n_estimators: 6, name: RF, random_state: 18}, sub: {n_neighbors: 15, smo_grp: UNDER, threshold_cleaning: 0.7447132207721371, type: NeighbourhoodCleaningRule}} Random 27 RF AllKNN Under resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: entropy, max_features: log2, min_samples_leaf: 2, min_samples_split: 18, n_estimators: 43, name: RF, random_state: 27}, sub: {allow_minority: True, kind_sel: mode, n_neighbors: 14, smo_grp: UNDER, type: AllKNN}} Random 29 RF AllKNN Under 0.8959 resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: entropy, max_features: log2, min_samples_leaf: 4, min_samples_split: 5, n_estimators: 142, name: RF, random_state: 29}, sub: {allow_minority: True, kind_sel: all, n_neighbors: 8, smo_grp: UNDER, type: AllKNN}} AllKNN Random RF Under resampling {classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: entropy, $max_features: 1, min_samples_leaf: 10, min_samples_split: 19, n_estimators: 81, name:$ RF, random_state: 36}, sub: {allow_minority: True, kind_sel: all, n_neighbors: 11, smo_grp: UNDER, type: AllKNN}} CondensedNearest Under Random 39 2, min_samples_split: 17, name: DTC, random_state: 39}, sub: {n_neighbors: 44, n_seeds_S: 12, random_state: 39, smo_grp: UNDER, type: CondensedNearestNeighbour}} Random EditedNearest Under 0.8925 Neighbours resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: gini, max_features: log2, min_samples_leaf: 19, min_samples_split: 3, n_estimators: 119, name: RF, random_state: 59}, sub: {kind_sel: all, n_neighbors: 12, smo_grp: UNDER, type: EditedNearestNeighbours}} Random RF ClusterCentroids 0.8899 resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: None, min_samples_leaf: 11, min_samples_split: 5, n_estimators: 125,

name: RF, random_state: 79}, sub: {estimator: KMeans, random_state: 79, smo_grp:

UNDER, type: ClusterCentroids, voting: soft}}

TABLE S-18

continued	on	the	next	column

			THIVEED TROWTRE		
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	Neighbourhood CleaningRule	Under resampling	0.8951
{classifier	: {boots	trap: False, o	class_weight: balanced		riterion: entropy,
			les_leaf: 6, min_samp		
			sub: {n_neighbors:		
			014, type: Neighbourh		
Random	109	RF	OneSidedSelection	Under resampling	0.8974
{classifier	: {boots	trap: False, o	lass_weight: balanced		riterion: entropy,
			es_leaf: 10, min_sam		
			sub: {n_neighbors: 1	9, n_seeds_S:	6, random_state:
	_grp: UN 9	DER, type: (OneSidedSelection}}	Hadan	0.006
TPE	9	Kr	EditedNearest Neighbours	Under resampling	0.906
{classifier	: {boots	trap: True, cla	ss_weight: balanced, o		y, max_features:
			_samples_split: 16, n_		
			all, n_neighbors: 1, si	mo_grp: UNDE	ER, type: Edited-
NearestNe			D 4E 4' 4	TYd	0.000
TPE	18	RF	RepeatedEdited NearestNeighbours	Under resampling	0.906
{classifier	: {boots	trap: True, c	lass_weight: balanced		riterion: entropy.
			les_leaf: 5, min_samp		
			b: {kind_sel: mode, n_	neighbors: 8, sn	no_grp: UNDER,
		tedNearestNe		773	0.001
TPE	27	RF	AllKNN	Under resampling	0.904
{classifier	: {boots	trap: False. o	l class_weight: balanced		riterion: entropy.
			_leaf: 3, min_samples_		
RF, rando	m_state:	27}, sub: {al	low_minority: True, k	ind_sel: mode,	n_neighbors: 13,
		, type: AllKN			
TPE	29	RF	AllKNN	Under	0.904
{classifier	· {boots	tran: True, cla	ss_weight: balanced, o	resampling	v max features:
			samples_split: 18, n_6		
			inority: False, kind_se		
UNDER,					
TPE	36	RF	EditedNearest	Under	0.904
{classifier	· {boots	tran: True c	Neighbours lass_weight: balanced	resampling	i max features:
			_samples_split: 11, n_		
dom_state	: 36}, sı	ub: {kind_sel:	all, n_neighbors: 5, s	mo_grp: UNDI	ER, type: Edited-
NearestNe					
TPE	39	RF	CondensedNearest	Under	0.909
{classifier	· {boots	tran: False o	Neighbour lass_weight: balanced	resampling	i max features:
			min_samples_split: 6,		
random_st	tate: 39}	, sub: {n_neig	ghbors: 47, n_seeds_S		
	,,,,		estNeighbour}}		
TPE	59	RF	AllKNN	Under	0.906
{classifier	· {hoot	strap: True,	class_weight: balanc	resampling red subsample	criterion: gini,
			es_leaf: 6, min_sample		
			ub: {allow_minority: F		
1, smo_gr		ER, type: All			
TPE	79	RF	ClusterCentroids	Under	0.8994
(alacaif	 	tron. Tena	lace waight: helen 4	resampling	i may faatuu
			lass_weight: balanced nin_samples_split: 3, i		
			: KMeans, random_sta		
		voting: soft}}			, ., pe.
TPE	90	RF	Neighbourhood	Under	0.904
	<u> </u>		CleaningRule	resampling	<u> </u>
			lass_weight: balanced		ni, max_features:
			in_samples_split: 2, eighbors: 3, smo_grp		
			ghbourhoodCleaningR		conoiu_cicaning:
TPE	109	RF	RepeatedEdited	Under	0.9048
			NearestNeighbours	resampling	0.5510
{classifier	: {boot	strap: False,	class_weight: balance	ed_subsample,	criterion: gini,
			_leaf: 2, min_samples_		
			kind_sel: all, n_neighb	ors: 2, smo_grp	o: UNDER, type:
Repeated	aneane	arestNeighbou	118}}		

TABLE S-19 "NEW-THYROID1" - CONTINUED FROM PREVIOUS COLUMN

{classifier: {bootstrap: False, class_weight: balanced, criterion: entropy, max_features:

1, min_samples_leaf: 8, min_samples_split: 8, n_estimators: 19, name: RF, ran-

dom_state: 90}, sub: {allow_minority: False, kind_sel: mode, n_neighbors: 17,

BorderlineSMOTE

{classifier: {C: 11.439169900812075, coef0: 0.38793838127194635, degree: 2, gamma:

auto, gamma_value: 3.564363364031135, kernel: poly, name: SVM, probability: False,

random_state: 109, shrinking: False, tol: 0.09248237128158954}, sub: {k_neighbors:

2, kind: borderline-1, m_neighbors: 3, random_state: 109, smo_grp: OVER, type:

{classifier: {C: 35.49604968767363, 11_ratio: 0.8394654870401828, name: LR,

penalty_solver: 12+sag, random_state: 9, tol: 0.015379601485652834}, sub: {ran-

scale, gamma_value: 2.517556708664174, kernel: rbf, name: SVM, probability: False,

random_state: 18, shrinking: False, tol: 0.006591026869056189}, sub: {categori-

cal_features: True, k_neighbors: 7, random_state: 18, smo_grp: OVER, type: SMO-

HardnessThreshold

{classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: entropy,

max_features: 1, min_samples_leaf: 3, min_samples_split: 7, n_estimators: 76, name:

RF, random_state: 27}, sub: {cv: 8, estimator: knn, random_state: 27, smo_grp:

{classifier: {C: 60.85867708192562, coef0: -0.9117905771622428, degree: 4, gamma:

value, gamma_value: 7.873497248644398, kernel: linear, name: SVM, probabil-

ity: False, random_state: 29, shrinking: True, tol: 0.09403410347251911}, sub:

{k_neighbors: 9, m_neighbors: 4, out_step: 0.9962299585700485, random_state: 29,

OneSidedSelection

{classifier: {bootstrap: True, class_weight: balanced, criterion: entropy, max_features:

1, min_samples_leaf: 13, min_samples_split: 17, n_estimators: 108, name: RF, ran-

dom_state: 36}, sub: {n_neighbors: 12, n_seeds_S: 12, random_state: 36, smo_grp:

auto, gamma_value: 0.9973878196058544, kernel: linear, name: SVM, probability:

True, random_state: 39, shrinking: False, tol: 0.080165475688721}, sub: {n_neighbors:

7, smo_grp: UNDER, threshold_cleaning: 0.43072590634086616, type: Neighbour-

Hardness Threshold

{classifier: {C: 66.4830011501743, coef0: -0.9747722572171734, degree: 2, gamma: auto, gamma_value: 5.582820161759245, kernel: sigmoid, name: SVM, probability:

True, random_state: 59, shrinking: True, tol: 0.09298176317257457}, sub: {cv: 7, esti-

mator: knn, random_state: 59, smo_grp: UNDER, type: InstanceHardnessThreshold}}

{classifier: {C: 86.83172244440834, coef0: -0.8969519564589864, degree: 2, gamma:

auto, gamma_value: 7.869170990805236, kernel: sigmoid, name: SVM, probability:

False, random_state: 79, shrinking: False, tol: 0.09924158206808104}, sub: {ran-

SMOTETomek

SMOTEENN

Instance

Neighbourhood

SVMSMOTE

SMOTENC

Instance

dom_state: 9, smo_grp: OVER, type: RandomOverSampler}}

SVM

RF

UNDER, type: InstanceHardnessThreshold}}

SVM

smo_grp: OVER, type: SVMSMOTE}}

UNDER, type: OneSidedSelection}}

hoodCleaningRule}}

TPE

RF

SVM

SVM

SVM

RF

dom_state: 79, smo_grp: COMBINE, type: SMOTEENN}}

RandomOverSampler

AllKNN

Res.Group

resampling

resampling

resampling

Under

Over

Under

Under

Under

resampling

Combine

Combine

resampling

resampling

resampling

resampling

resampling

GM

0 9944

0.9972

0.9972

0 9944

0.9972

0.9972

0.9972

Method Seed Classifier Resampler

RF

smo_grp: UNDER, type: AllKNN}}
Random | 109 | SVM | Bo

BorderlineSMOTE}}

TENC}}

TPE

"NEW-THYROID1" Method Seed Classifier Resampler Res.Group GM SVM SMOTE 0.9944 Grid Over resampling 18 SVM SMOTE 0.9944 Grid Over resampling 0.9944 Grid 27 SVM SMOTE Over resampling Grid 29 SVM SMOTE Over 0.9944 resampling SVM 0.9944 Grid 36 SMOTE Over resampling SVM SMOTE 0.9944 Grid 39 Over resampling SVM 59 SMOTE 0 9944 Grid Over resampling 79 SVM SMOTE 0.9944 Grid Over resampling SVM SMOTE Over 0.9944 Grid 90 resampling 109 SVM SMOTE Over 0.9944 Grid resampling Random LR SMOTENC Over 0.9944 penalty_solver: 12+newton-cg, random_state: 9, tol: 0.029096464508344525}, sub: {categorical_features: True, k_neighbors: 1, random_state: 9, smo_grp: OVER, type: SMOTENC \} 0.9972 Random KNN Instance HardnessThreshold resampling {classifier: {algorithm: brute, n_neighbors: 22, name: KNN, p: 1, random_state: 18, weights: distance}, sub: {cv: 7, estimator: adaboost, random_state: 18, smo_grp: UNDER, type: InstanceHardnessThreshold}} RF Instance HardnessThreshold resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: 1, min_samples_leaf: 3, min_samples_split: 17, n_estimators: 67, name: RF, random_state: 27}, sub: {cv: 4, estimator: decision-tree, random_state: 27, smo_grp: UNDER, type: InstanceHardnessThreshold}} Random RF OneSidedSelection Under resampling {classifier: {bootstrap: True, class_weight: None, criterion: entropy, max_features: 1, min_samples_leaf: 9, min_samples_split: 16, n_estimators: 134, name: RF, random_state: 29}, sub: {n_neighbors: 1, n_seeds_S: 18, random_state: 29, smo_grp: UNDER, type: OneSidedSelection}} RF AllKNN 0.9972 Random 36 Under resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: entropy, max_features: 1, min_samples_leaf: 1, min_samples_split: 19, n_estimators: 142, name: RF, random_state: 36}, sub: {allow_minority: True, kind_sel: all, n_neighbors: 18, smo_grp: UNDER, type: AllKNN}} RandomUnderSampler SVM Under Random {classifier: {C: 118.27491871654843, coef0: -0.7013771573751213, degree: 4, gamma: scale, gamma_value: 7.553834176279271, kernel: sigmoid, name: SVM, probability: False, random_state: 39, shrinking: True, tol: 0.010200595741797599}, sub: {ran $dom_state: 39, replacement: False, smo_grp: UNDER, type: RandomUnderSampler\}\}$ SVM KMeansSMOTE 0.9972 Random Over resampling {classifier: {C: 65.07402399123973, coef0: -0.9208479414355175, degree: 4, gamma: scale, gamma_value: 7.988911075763181, kernel: sigmoid, name: SVM, probability: False, random_state: 59, shrinking: False, tol: 0.04541002260639259}, sub: {cluster_balance_threshold: 0.7919138323869498, k_neighbors: 4, random_state: 59, smo_grp: OVER, type: KMeansSMOTE}} SVM SMOTEENN Random

TABLE S-19

sino_grp. O t Lit, t	ype. Itivicans	SMOTE								'
Random 79	SVM	SMOTEENN	Combine	0.9972	{classifier			class_weight: balan		
			resampling		_			_leaf: 12, min_samp	- 1 -	′ 1
{classifier: {C: 57.	49962942618	902, coef0: -0.898461194	3322356, degre	e: 4, gamma:			n_state: 90},	sub: {random_state:	90, smo_grp: CC	MBINE, type:
auto, gamma_valu	e: 4.4761776	11304981, kernel: sigmoi	id, name: SVM	, probability:	SMOTETO	omek}}				
True, random_stat	e: 79, shrink	ing: False, tol: 0.025126	6604212062257	, sub: {ran-	TPE	109	SVM	SVMSMOTE	Over	0.9972
dom state: 79, sme	grp: COMI	BINE, type: SMOTEENN	}}	, ,					resampling	
	-C 1	cont	inued on the i	next column	{classifier	: {C: 30.	.34926407952	25184, coef0: 0.50225	39524484256, deg	ree: 3, gamma:
					scale, gan	ıma_valu	ie: 3.9860756	07291251, kernel: pol	, name: SVM, pro	obability: True,
					random_s	tate: 109	, shrinking: Fa	alse, tol: 0.090163997	8992194}, sub: {	k_neighbors: 3,
					m_neighb	ors: 9, or	ut_step: 0.812	27730316556684, rand	om_state: 109, sn	no_grp: OVER,
					type: SVN	MSMOTI	Ξ}}			

90

TABLE S-20 "NEW-THYROID2"

$TABLE\ S-20$ "New-thyroid2" — continued from previous column

			NEW-TH TROID2			Method	Seed	Classifier	Resampler	Res.Group	GM
Method	Seed	Classifier	Resampler	Res.Group	GM	Random	90	RF	SMOTE	Over	0.9972
Grid	9	RF	NearMiss	Under	0.9944	(-1:£	. (14-	т	lana analaha Mana	resampling	
0.1	10	IZNINI	CVD (C) (OTE	resampling	0.0000				lass_weight: None, cr samples_split: 7, n_e		
Grid	18	KNN	SVMSMOTE	Over resampling	0.9888				bors: 4, random_stat		
Grid	27	RF	RandomUnderSampler	Under	0.9916	SMOTE}		. – 0	_		
			•	resampling		Random	109	RF	OneSidedSelection	Under	0.9972
Grid	29	KNN	SVMSMOTE	Over	0.9888	(-1:6	. (1		-1	resampling	
Crid	36	KNN	PandamOvarCamplar	resampling Over	0.9916	max feati	: {DOOL	strap: 1rue, nin samples l	class_weight: balanc leaf: 5, min_samples_s	ed_subsample,	eriterion: gini,
Grid	30	KININ	RandomOverSampler	resampling	0.9910				{n_neighbors: 14, n_s		
Grid	39	RF	RandomUnderSampler	Under	0.9888				dedSelection}}		,
			<u>.</u>	resampling		TPE	9	RF	Neighbourhood	Under	0.9972
Grid	59	LR	SMOTEENN	Combine	0.9916	(1 :0			CleaningRule	resampling	
Grid	79	KNN	SMOTE	resampling Over	0.9888				lass_weight: balanced _samples_split: 5, n		
Gild	1)	KINI	SWOTE	resampling	0.5000				ighbors: 3, smo grp:		
Grid	90	KNN	SMOTE	Over	0.9916				eighbourhoodCleaning		conora_creaming.
				resampling		TPE	18	RF	OneSidedSelection	Under	0.9972
Grid	109	RF	SVMSMOTE	Over	0.9944		l			resampling	
Random	9	SVM	CondensedNearest	resampling Under	0.9944				lass_weight: balanced		
rumuom	_	5 / 1.1	Neighbour	resampling	0.55.1				amples_split: 12, n_esbors: 15, n_seeds_S:		
			1946, coef0: -0.890192428					eSidedSelecti		o, random_stat	c. ro, smo_grp.
			4466376783, kernel: sign			TPE	27	RF	AllKNN	Under	1.0
			shrinking: True, tol: 0.00							resampling	
densedNea			29, random_state: 9, smo	grp: UNDER	i, type: Con-	{classifier	: {bootst	rap: True, cla	ss_weight: balanced, o	criterion: entrop	y, max_features:
Random	18	RF	EditedNearest	Under	0.9972				samples_split: 16, n_e inority: False, kind_se		
			Neighbours	resampling		UNDER,			mority. Paise, kind_se.	i. aii, ii_iicigiio	ors. 6, smo_grp.
			lass_weight: balanced_sul			TPE	29	RF	SMOTETomek	Combine	1.0
			eaf: 4, min_samples_split:							resampling	
EditedNea			d_sel: mode, n_neighbors	: 1, smo_grp: U	NDER, type:				ss_weight: balanced, o		
Random	27	RF	AllKNN	Under	0.9972				_samples_split: 16, n		
random	27	141	7 HILL VIV	resampling	0.5572	TPE	: 29}, su	SVM	tate: 29, smo_grp: CO Neighbourhood	Under	0.9972
			ss_weight: balanced, crite	rion: entropy, 1		11 L	30	S V IVI	CleaningRule	resampling	0.9972
			samples_split: 15, n_estir			{classifier	: {C: 102	.5082678217	494, coef0: -0.3522939	90390472237, d	egree: 4, gamma:
			nority: False, kind_sel: al	l, n_neighbors:	: 2, smo_grp:				7847885463, kernel:		
UNDER, t	29 29	SVM	SVMSMOTE	Over	0.9972				shrinking: False, tol		
				resampling				mo_grp: UNL aningRule}}	DER, threshold_cleanin	ig: 0.29045055	90620823, type:
			401, coef0: -0.1095777961	4901764, degre		TPE	39	RF	SMOTE	Over	0.9972
			5034694424, kernel: line							resampling	*****
			shrinking: True, tol: 0.0						lass_weight: balanced		
		n_neighbors: ype: SVMSM	3, out_step: 0.779323471	2092027, Tando	om_state: 29,				_leaf: 17, min_sample		
Random	36	RF	EditedNearest	Under	0.9972	type: SM0		_state: 39}, su	b: {k_neighbors: 3, ran	idom_state: 39,	smo_grp: Ovek,
			Neighbours	resampling		TPE	59	RF	AllKNN	Under	0.9972
			lass_weight: balanced_sul							resampling	
			eaf: 11, min_samples_split						ss_weight: balanced, o		
EditedNea			id_sel: mode, n_neighbors	: 1, smo_grp: U	INDER, type:				amples_split: 12, n_e		
Random	39	SVM	SMOTEENN	Combine	0.9972				minority: False, kind	l_sel: mode, n	_neighbors: 18,
				resampling		TPE	79	, type: AllKN	NearMiss	Under	0.9972
			4004, coef0: 0.243494158			11.2	' '	10	1 (Curiviiss	resampling	0.5572
	_		5146224, kernel: poly, nan			{classifier	: {bootst	rap: True, cla	ss_weight: balanced, o		y, max_features:
			ue, tol: 0.0844417151278 SMOTEENN}}	0263}, sub: {r	andom_state:				samples_split: 17, n_e		
Random	59	LR	SMOTENC	Over	0.9944				ors: 5, n_neighbors_ve	r3: 19, smo_grp	o: UNDER, type:
rumuom	0,	211	51.1012110	resampling	0.55.1	NearMiss, TPE	90	SVM	SMOTE	Over	0.9972
{classifier:	{C: 6.	26415868289	50375, 11_ratio: 0.10534		, name: LR,	II E	90	3 7 171	SWOTE	resampling	0.9972
			m_state: 59, tol: 0.05332						8267, coef0: -0.914752	29042522482, d	
		True, k_neig	hbors: 2, random_state: :	59, smo_grp:	OVER, type:				147334015, kernel: si		
SMOTEN Random	79	RF	TomekLinks	Under	0.9972				shrinking: False, tol:		
Nandoni	19	VI.	TOHICKLIIKS	resampling	0.9972	`			90, smo_grp: OVER,		,
{classifier:	{boots	trap: True, c	lass_weight: balanced_sul		rion: entropy,	TPE	109	RF	SMOTE	Over resampling	0.9972
max_featu	res: 1, n	nin_samples_l	eaf: 5, min_samples_split	: 3, n_estimato		{classifier	: {boots	strap: True,	class_weight: balanc		criterion: gini,
RF, randoi	n_state:	79}, sub: {sn	no_grp: UNDER, type: To						eaf: 1, min_samples_s		
			conti	nued on the i	next column			109}, sub: {	k_neighbors: 8, rando	m_state: 109, s	mo_grp: OVER,
						type: SM0	JTE}}				

TABLE S-21 "ECOLI2"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	SVM	KMeansSMOTE	Over	0.9335
				resampling	
Grid	18	SVM	RandomOverSampler	Over	0.9348
				resampling	
Grid	27	SVM	SMOTE	Over	0.9365
~	• •		23 COMP	resampling	
Grid	29	SVM	SMOTE	Over	0.9365
0.1					
Grid	30	SVM	SMOTE	Over	0.9365
Grid	39	SVM	SMOTEENN	resampling Combine	0.9348
Onu	39	SVIVI	SWICTEENIN	resampling	0.9340
Grid	59	SVM	SMOTETomek	Combine	0.94
Ona	"	5 7 1.12	Sino 12 Tomes	resampling	0.,
Grid	79	SVM	SMOTE	Over	0.9382
				resampling	
Grid	90	SVM	SMOTE	Over	0.9365
				resampling	
Grid	109	SVM	KMeansSMOTE	Over	0.9336
				resampling	
Random	9	KNN	TomekLinks	Under	0.932
	L			resampling	
			e, n_neighbors: 17, name		random_state:
			o_grp: UNDER, type: To		
Random	18	KNN	Instance	Under	0.9335
(-1 '£	. (-1:	41	HardnessThreshold	resampling	1
			_neighbors: 32, name: K		
			estimator: decision-tree	, random_state:	18, smo_grp:
Random	1ype: 1ns	tanceHardnes	TomekLinks	Under	0.9319
Kandom	21	KININ	TOMEKLINKS	resampling	0.9319
Lelassifier	· Jalgori	thm: ball tree	e, n_neighbors: 23, name		random state:
			no_grp: UNDER, type: T		random_state.
Random	29	KNN	TomekLinks	Under	0.9305
rundom		TEI VII V	TomeREIIIRS	resampling	0.7505
{classifier	: {algori	thm: brute, n	_neighbors: 14, name: K		dom state: 29.
			rp: UNDER, type: Tome		
Random	36	KNN	AllKNN	Under	0.9337
				resampling	
{classifier	: {algor	ithm: brute,	n_neighbors: 24, name:	KNN, p: 17,	random_state:
36, weigh	ts: distar	nce}, sub: {al	low_minority: False, kin	d_sel: mode, n	_neighbors: 5,
smo_grp:	UNDER	, type: AllKN	IN}}		
Random	39	KNN	EditedNearest	Under	0.9369
			Neighbours	resampling	
			_neighbors: 30, name: K		
			sel: mode, n_neighbors:	16, smo_grp: 1	UNDER, type:
EditedNea					
Random	59	KNN	TomekLinks	Under	0.9353
(1 10	L			resampling	
			e, n_neighbors: 26, name		random_state:
			no_grp: UNDER, type: T		
Random	79	KNN	EditedNearest	Under	0.9303
(-1- '0	[[-1 .	Albarra Ib. d	Neighbours	resampling	1 70
			_neighbors: 26, name: K		
			sel: mode, n_neighbors:	4, smo_grp: U	JNDEK, type:
EditedNea	uesuveig	noours } }			

continued on the next column

TABLE S-21
"ECOLI2" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	KNN	TomekLinks	Under	0.9369
(1 'C	(1)	1 1 .	: 11 20	resampling	0 1 00
					p: 0, random_state: 90,
			rp: UNDER, ty		
Random	109	KNN	No	No	0.9353
Coloccifion	(algori	thm: ball trac	resampling	resampling	N, p: 14, random_state:
			mo_grp: NO, ty		v, p. 14, random_state.
TPE	9	KNN	AllKNN	Under	0.9369
IPE	9	KININ	AllKININ	resampling	0.9309
Sclassifier	Jalgori	thm: ball tree	n neighbors:	24 name: KN	N, p: 0, random_state:
					node, n_neighbors: 17,
		, type: AllKN		ise, kiiid_sei. i	node, n_nerghbors. 17,
TPE	18	KNN	EditedNearest	Under	0.9369
11.2	10	Tanti (Neighbours	resampling	0.7507
{classifier	: {algori	thm: ball tree			N, p: 0, random_state:
					mo_grp: UNDER, type:
EditedNea					-01
TPE	27	KNN	TomekLinks	Under	0.9369
				resampling	
{classifier:	{algori	thm: brute, n	_neighbors: 12,	name: KNN,	p: 0, random_state: 27,
weights: u	niform},	sub: {smo_g	rp: UNDER, ty	pe: TomekLink	s}}
TPE	29	KNN	RepeatedEdite	d Under	0.9337
			NearestNeight		
{classifier	: {algori	thm: auto, n_	neighbors: 29, 1	name: KNN, p	: 17, random_state: 29,
				eighbors: 7, sn	no_grp: UNDER, type:
RepeatedE	ditedNe	arestNeighbou	ırs}}		
TPE	36	KNN	No	No	0.9337
			resampling	resampling	
					: 11, random_state: 36,
			rp: NO, type: N		
TPE	39	SVM	SMOTENC	Over	0.94
(1 :0	(0.50	10002011111	0.62 60 0.0	resampling	746 1 2
					746, degree: 2, gamma:
					ne: SVM, probability:
					544126808}, sub: {cat-
		True, K_neig	nbors: 9, rando	m_state: 39, s	smo_grp: OVER, type:
SMOTEN TPE	C}}	KNN	No	No	0.9353
IPE	39	KININ	resampling	resampling	0.9555
Lelaccifier	Lalgori	thm: brute n			: 13, random_state: 59,
			rp: NO, type: N		. 15, randoni_state. 59,
TPE	79 79	KNN	No.	No	0.9353
IFE	19	IZININ	resampling	resampling	0.9555
{classifier	{algori	thm: auto n			: 15, random_state: 79,
			rp: NO, type: N		. 13, rundom_state. 72,
TPE	90	KNN	TomekLinks	Under	0.9369
111	70	121111	TOHICKLIIKS	resampling	0.9309
{classifier	: {algori	thm: brute. n	neighbors: 27.		p: 0, random_state: 90,
			rp: UNDER, ty		
TPE	109	KNN	RepeatedEdite		0.9353
	/	/	NearestNeight		0.,555
{classifier	: {algori	thm: kd tree.			V, p: 17, random_state:
					no_grp: UNDER, type:
		arestNeighbou		. , .	~. , ,,,,
1			.,		

TABLE S-22 "SEGMENTO" – CONTINUED FROM PREVIOUS COLUMN

						Method	Seed	Classifier	Resampler	Res.Group	GM
			TABLE S-22			Random	90	LR	SVMSMOTE	Over resampling	0.9987
			"SEGMENTO"			{classifier	: {C: :	55.610576119	l		94, name: LR,
Method	Seed	Classifier	Resampler	Res.Group	GM				random_state: 90, tol:		
Grid	9	RF	SVMSMOTE	Over	0.9967			m_neighbors: type: SVMSN	1, out_step: 0.300992	13095258226, ra	ndom_state: 90,
Grid	18	RF	BorderlineSMOTE	resampling	0.9959	Random	109	SVM	EditedNearest	Under	0.9995
Giid	10	Kr	BorderiniesWOTE	Over resampling	0.9939	ramaom	107	0,111	Neighbours	resampling	0.,,,,
Grid	27	RF	ADASYN	Over	0.9975				9927, coef0: 0.713103		
0.11	20	DE	CVIMONOTE	resampling	0.0067				'9328954, kernel: poly False, tol: 0.05812008		
Grid	29	RF	SVMSMOTE	Over resampling	0.9967				ER, type: EditedNeare		. (Kiliu_sci. ali,
Grid	36	RF	SVMSMOTE	Over	0.9965	TPE	9	SVM	ClusterCentroids	Under	0.9995
0.11	20	DE	D 1 1: CMOTE	resampling	0.0077	(-1:6	(C: 14	0(22(29502)	5587, coef0: 0.912419	resampling	
Grid	39	RF	BorderlineSMOTE	Over resampling	0.9977				581969811, kernel: 1		
Grid	59	RF	BorderlineSMOTE	Over	0.9962				g: True, tol: 0.0189114		
Cit	70	I D	CVMCMOTE	resampling	0.0057				grp: UNDER, type: C		
Grid	79	LR	SVMSMOTE	Over resampling	0.9957	TPE	18	SVM	ADASYN	Over resampling	0.9992
Grid	90	RF	SVMSMOTE	Over	0.9965	{classifier	: {C: 17	.32867220712	3354, coef0: 0.355990		gree: 4, gamma:
0.11	100	DE	CVIMONOTE	resampling	0.0050				69690297, kernel: poly		
Grid	109	RF	SVMSMOTE	Over resampling	0.9959				lse, tol: 0.0673377651		n_neighbors: 5,
Random	9	SVM	SMOTE	Over	0.9987	TPE	27	LR LR	ER, type: ADASYN} SMOTENC	Over	0.9992
				resampling		112		LK	SMOTENCE .	resampling	0.,,,,2
			5117, coef0: 0.076251012 74038563, kernel: poly, n						28597, 11_ratio: 0.4		
			e, tol: 0.02337524413256						random_state: 27, toleighbors: 1, random_s		
			ER, type: SMOTE}}	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		SMOTEN		ies. iiue, k_i	leighbors. 1, fandoni_s	state. 27, sino_g	ip. OVEK, type.
Random	18	SVM	SMOTE	Over	0.999	TPE	29	SVM	EditedNearest	Under	0.9992
{classifier	. {C· 12	56467706659	 98628, coef0: 0.62244764	resampling	ree: 4 gamma:	(1 :0	(0.14	(2252572(0)	Neighbours	resampling	2
			61982053, kernel: poly, n						0575, coef0: 0.140379 4670683475, kernel:		
			ue, tol: 0.0053738212866	35412}, sub: {1	_neighbors: 2,				ng: False, tol: 0.08847		
			ER, type: SMOTE}}		0.000	all, n_neig	ghbors: .	3, smo_grp: U	NDER, type: EditedN	earestNeighbour	s}}
Random	27	LR	RandomOverSampler	Over resampling	0.999	TPE	36	SVM	BorderlineSMOTE	Over	0.9992
{classifier	: {C:	65.767668765	56629, 11_ratio: 0.6593		, name: LR,	{classifier	 : {C: 13	 3.30259826852	l 2118, coef0: 0.664973	resampling 6319816826, de	gree: 4. gamma:
			m_state: 27, tol: 0.01845		(4), sub: {ran-				41066813, kernel: poly		
Random	27, sm	SVM	k, type: RandomOverSam SMOTETomek	Combine	0.9992				rue, tol: 0.081347685		
Kandom	29	S V IVI	SWOTETOILER	resampling	0.9992	7, Kind: Borderline			nbors: 6, random_stat	te: 36, smo_gr	o: OVER, type:
			3731, coef0: -0.97028543			TPE	39	SVM	ADASYN	Over	0.9992
			010284013, kernel: line king: False, tol: 0.0469			(1 12				resampling	
			BINE, type: SMOTETom		/ j, sub. (lali-				206, coef0: 0.7418779 54152088, kernel: poly		
Random	36	LR	SMOTENC	Over	0.999				rue, tol: 0.0097116414		
(-1:6	(C)	06 647050144	542220 11 mg/m 0.676	resampling	I D	7, random	_state: 3		OVER, type: ADASYI		
			543228, 11_ratio: 0.670 om_state: 36, tol: 0.0678			TPE	59	SVM	SMOTENC	Over	0.9992
			hbors: 2, random_state:			{classifier	· {C· 21	46317104811	 3878, coef0: 0.719700	resampling 19014882161 de	oree: 2 gamma:
SMOTEN									740926446, kernel: p		
Random	39	LR	RandomOverSampler	Over	0.9992				king: False, tol: 0.05		
{classifier	: {C: 5	3.4907756114	 	resampling 558980238070	5, name: LR,	egorical_f SMOTEN	eatures:	rrue, k_neig	hbors: 4, random_sta	te: 59, smo_gr	o: OVER, type:
penalty_se	olver: 12	+lbfgs, rando	m_state: 39, tol: 0.0817	773022884311		TPE	79	SVM	EditedNearest	Under	0.9992
			type: RandomOverSam		0.000				Neighbours	resampling	
Random	59	SVM	ADASYN	Over resampling	0.999				7177, coef0: 0.675466	,	
			028, coef0: -0.084127768	13298128, deg					3600963375, kernel: ng: True, tol: 0.08550		
			7060163317, kernel: lii						NDER, type: EditedN		
			shrinking: True, tol: 0. 59, smo_grp: OVER, typ			TPE	90	SVM	SVMSMOTE	Over	0.9992
Random	79	SVM	ADASYN	Over	0.999	(classifier	· 1C+ 40	26830780560	 037, coef0: -0.778933	resampling 7522161955 de	gree: 3 gamma:
				resampling					52599459, kernel: rbf,		
			4771, coef0: 0.32077567			random_st	tate: 90,	shrinking: Tr	ue, tol: 0.0674046626	0817714}, sub:	k_neighbors: 7,
			38096852497, kernel: p shrinking: True, tol: (m_neighb			95873007559433, rand	lom_state: 90, s	mo_grp: OVER,
			79, smo_grp: OVER, typ			TPE	109	SVM	EditedNearest	Under	0.9995
			con	tinued on the	next column	11.2	107	5,141	Neighbours	resampling	0.7773
									9927, coef0: 0.713103	3618700079, de	
									9328954, kernel: poly False, tol: 0.05812008		
									ER, type: EditedNeare		. (Kina_sci. aii,
							, ~	1 · · ·		5	

TABLE S-23 "GLASS6"

	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	DT	TomekLinks	Under	0.9327
0 : 1	10	-	D. C. D.	resampling	
Grid	18	RF	EditedNearest	Under	0.9404
~			Neighbours	resampling	
Grid	27	RF	EditedNearest	Under	0.937
a	20	D.F.	Neighbours	resampling	0.026
Grid	29	RF	CondensedNearest	Under	0.9364
G : 1	26	DE	Neighbour	resampling	0.020
Grid	36	RF	RandomUnderSampler	Under	0.9398
Grid	39	RF	OneSidedSelection	resampling Under	0.9432
Ollu	39	KI.	OllesidedSelection		0.943.
Grid	59	DT	SVMSMOTE	resampling Over	0.935
Giiu	39	DI	SVMSMOTE	resampling	0.933
Grid	79	RF	TomekLinks	Under	0.937
Ona	' '	141	TomeREMIKS	resampling	0.557
Grid	90	RF	Neighbourhood	Under	0.937
			CleaningRule	resampling	
Grid	109	RF	EditedNearest	Under	0.940
			Neighbours	resampling	
Random	9	KNN	RandomUnderSampler	Under	0.956
			-	resampling	
{classifier	: {algor	ithm: auto, n	_neighbors: 37, name: K	NN, p: 7, rand	dom_state: 9
			m_state: 9, replacement: Tr		
RandomU			•		- •
Random	18	KNN	ClusterCentroids	Under	0.957
				resampling	
			_neighbors: 40, name: KN		
weights: o	listance)	, sub: {estin	nator: MiniBatchKMeans,	random_state:	18, smo_grp
UNDER,	type: Cl	usterCentroid	s, voting: hard}}		
Random	27	KNN	ClusterCentroids	Under	0.951
				resampling	
			n_neighbors: 34, name: K	NN, p: 13, rand	
weights: o	listance)	, sub: {estin	nator: MiniBatchKMeans,	NN, p: 13, rand	
weights: o	listance)	, sub: {estin	nator: MiniBatchKMeans, s, voting: hard}}	NN, p: 13, rand	
weights: o	listance)	, sub: {estin	nator: MiniBatchKMeans,	NN, p: 13, rand random_state:	27, smo_grp
weights: o UNDER, Random	listance) type: Cl	, sub: {estimusterCentroid	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids	NN, p: 13, rand random_state: Under resampling	27, smo_grp
weights: c UNDER, Random {classifier	type: Cl 29 : {algori	, sub: {estimusterCentroid KNN ithm: brute, r	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: Kl	NN, p: 13, rand random_state: Under resampling NN, p: 4, random_state	27, smo_grp 0.971 om_state: 29
weights: c UNDER, Random {classifier weights: c	type: Cl 29 : {algori	, sub: {estimusterCentroid KNN ithm: brute, r, sub: {estim	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: Ki nator: MiniBatchKMeans,	NN, p: 13, rand random_state: Under resampling NN, p: 4, random_state	27, smo_grp 0.971 om_state: 29
weights: c UNDER, Random {classifier weights: c UNDER,	type: Cl 29 : {algori distance} type: Cl	, sub: {estimusterCentroid KNN ithm: brute, r , sub: {estimusterCentroid kny }	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: Kl nator: MiniBatchKMeans, s, voting: soft}}	NN, p: 13, rand random_state: Under resampling NN, p: 4, randorandom_state:	0.9710 0.9710 0m_state: 29 29, smo_grp
weights: c UNDER, Random {classifier weights: c UNDER,	type: Cl 29 : {algori	, sub: {estimusterCentroid KNN ithm: brute, r, sub: {estim	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: Ki nator: MiniBatchKMeans,	NN, p: 13, rand random_state: Under resampling NN, p: 4, randor random_state: Under	0.971 0.971 0m_state: 29 29, smo_grp
weights: c UNDER, Random {classifier weights: c UNDER, Random	type: Cl 29 : {algori	, sub: {estimusterCentroid KNN	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: K! nator: MiniBatchKMeans, s, voting: soft}} ClusterCentroids	NN, p: 13, rand random_state: Under resampling NN, p: 4, randorandom_state: Under resampling	0.971 0.971 0m_state: 29 29, smo_grp 0.960
weights: c UNDER, Random {classifier weights: c UNDER, Random {classifier	type: Cl 29 : {algoridistance} type: Cl 36 : {algoridistance} : {algoridistance}	, sub: {estinusterCentroid KNN ithm: brute, r , sub: {estinusterCentroid KNN ithm: brute, r }	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: Kl nator: MiniBatchKMeans, s, voting: soft}} ClusterCentroids n_neighbors: 31, name: Kl	NN, p: 13, rand random_state: Under resampling NN, p: 4, rander random_state: Under resampling NN, p: 8, rander	27, smo_grp 0.971 0.971 0m_state: 29 29, smo_grp 0.960 0m_state: 36
weights: c UNDER, Random {classifier weights: c UNDER, Random {classifier weights: c	type: Cl 29 : {algoridistance} type: Cl 36 : {algoridistance}	sub: {estinusterCentroid KNN	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: K! nator: MiniBatchKMeans, s, voting: soft}} ClusterCentroids n_neighbors: 31, name: K! nator: MiniBatchKMeans, sator: MiniBatchKMeans,	NN, p: 13, rand random_state: Under resampling NN, p: 4, rander random_state: Under resampling NN, p: 8, rander	27, smo_grp 0.971 0.971 0m_state: 29 29, smo_grp 0.960 0m_state: 36
weights: c UNDER, Random {classifier weights: c UNDER, Random {classifier weights: c UNDER,	listance) type: Cl 29 : {algori listance} type: Cl 36 : {algori listance} type: Cl type: Cl ype: Cl control control type: Cl	s, sub: {estinusterCentroid KNN tithm: brute, r s, sub: {estinusterCentroid KNN tithm: brute, r s, sub: {estinusterCentroid KNN tithm: brute, r s, sub: {estinusterCentroid usterCentroid	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: K1 nator: MiniBatchKMeans, s, voting: soft}} ClusterCentroids n_neighbors: 31, name: K1 nator: MiniBatchKMeans, s, voting: hard}}	NN, p: 13, rand random_state: Under resampling NN, p: 4, rand- random_state: Under resampling NN, p: 8, rand- random_state:	27, smo_grp 0.971 0.971 0m_state: 29 29, smo_grp 0.960 0m_state: 36 36, smo_grp
weights: c UNDER, Random {classifier weights: c UNDER, Random {classifier weights: c UNDER,	type: Cl 29 : {algoridistance} type: Cl 36 : {algoridistance}	sub: {estinusterCentroid KNN	nator: MiniBatchKMeans, s, voting: hard}} ClusterCentroids n_neighbors: 27, name: Kl nator: MiniBatchKMeans, s, voting: soft}} ClusterCentroids n_neighbors: 31, name: Kl nator: MiniBatchKMeans, s, voting: hard} Neighbourhood	NN, p: 13, rand random_state: Under resampling NN, p: 4, rander random_state: Under resampling NN, p: 8, rander random_state: Under under resampling NN, p: 8, rander random_state: Under	0.9710 0.9710 0.9710 0.96000 0.96000 0.96000 0.96000 0.96000 0
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continued on the next column

TABLE S-23 "GLASS6" – CONTINUED FROM PREVIOUS COLUMN

Method Seed Classifier Resampler Res.Group GM Random 90 DT SMOTENC Over resampling 0.9433 resamples {classifier: {criterion: gini, max_depth: 8, max_features: sqrt, min_samples_leaf: 5, min_samples_leaf: 5, min_samples_leaf: 5, mo_grp: OVER, type: SMOTENC}} Random 109 DT RandomUnderSampler Under resampling 0.9428 resampling {classifier: {criterion: gini, max_depth: 8, max_features: log2, min_samples_leaf: 2, min_samples_leaf:								
classifier: {criterion: gini, max_depth: 8, max_features: sqrt, min_samples_leaf: 5, min_samples_split: 6, name: DTC, random_state: 90}, sub: {categorical_features: True, k_neighbors: 3, random_state: 90, smo_grp: OVER, type: SMOTENC}} Random								
{classifier: {criterion: gini, max_depth: 8, max_features: sqrt, min_samples_leaf: 5, min_samples_split: 6, name: DTC, random_state: 90}, sub: {categorical_features: True, k_neighbors: 3, random_state: 90, smo_grp: OVER, type: SMOTENC}} Random 109 DT RandomUnderSampler Under resampling 0.9428 {classifier: {criterion: gini, max_depth: 8, max_features: log2, min_samples_leaf: 2, min_samples_split: 4, name: DTC, random_state: 109}, sub: {random_state: 109, replacement: True, smo_grp: UNDER, type: RandomUnderSampler}} TPE 9 KNN ClusterCentroids Under resampling {classifier: {algorithm: kd_tree, n_neighbors: 28, name: KNN, p: 10, random_state: 9, weights: distance}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} TPE 18 KNN ClusterCentroids Under resampling {classifier: {algorithm: ball_tree, n_neighbors: 30, name: KNN, p: 19, random_state: 18, weights: distance}, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER, type: UNDER, type: ClusterCentroids								
min_samples_split: 6, name: DTC, random_state: 90}, sub: {categorical_features: True, k_neighbors: 3, random_state: 90, smo_grp: OVER, type: SMOTENC}} Random								
k_neighbors: 3, random_state: 90, smo_grp: OVER, type: SMOTENC}} Random 109 DT RandomUnderSampler Under resampling 0.9428 {classifier: {criterion: gini, max_depth: 8, max_features: log2, min_samples_leaf: 2, min_samples_leaf:								
{classifier: {criterion: gini, max_depth: 8, max_features: log2, min_samples_leaf: 2, min_samples_split: 4, name: DTC, random_state: 109}, sub: {random_state: 109, replacement: True, smo_grp: UNDER, type: RandomUnderSampler}} TPE								
{classifier: {criterion: gini, max_depth: 8, max_features: log2, min_samples_leaf: 2, min_samples_split: 4, name: DTC, random_state: 109}, sub: {random_state: 109, replacement: True, smo_grp: UNDER, type: RandomUnderSampler}} TPE 9 KNN ClusterCentroids Under resampling {classifier: {algorithm: kd_tree, n_neighbors: 28, name: KNN, p: 10, random_state: 9, weights: distance}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} TPE 18 KNN ClusterCentroids Under resampling {classifier: {algorithm: ball_tree, n_neighbors: 30, name: KNN, p: 19, random_state: 18, weights: distance}, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER, smo_grp: UNDER, smo_grp: UNDER, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER,								
min_samples_split: 4, name: DTC, random_state: 109}, sub: {random_state: 109, replacement: True, smo_grp: UNDER, type: RandomUnderSampler}} TPE								
replacement: True, smo_grp: UNDER, type: RandomUnderSampler}} TPE								
{classifier: {algorithm: kd_tree, n_neighbors: 28, name: KNN, p: 10, random_state: 9, weights: distance}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} TPE								
{classifier: {algorithm: kd_tree, n_neighbors: 28, name: KNN, p: 10, random_state: 9, weights: distance}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} TPE 18 KNN ClusterCentroids Under resampling {classifier: {algorithm: ball_tree, n_neighbors: 30, name: KNN, p: 19, random_state: 18, weights: distance}, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER,								
9, weights: distance}, sub: {estimator: KMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids, voting: hard}} TPE								
TPE 18 KNN ClusterCentroids Under resampling (classifier: {algorithm: ball_tree, n_neighbors: 30, name: KNN, p: 19, random_state: 18, weights: distance}, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER,								
{classifier: {algorithm: ball_tree, n_neighbors: 30, name: KNN, p: 19, random_state: 18, weights: distance}, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER,								
{classifier: {algorithm: ball_tree, n_neighbors: 30, name: KNN, p: 19, random_state: 18, weights: distance}, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER,								
18, weights: distance}, sub: {estimator: KMeans, random_state: 18, smo_grp: UNDER,								
type: ClusterCentroids voting: hard\\								
TPE 27 RF RandomOverSampler Over 0.9432								
resampling								
max_features: 1, min_samples_leaf: 1, min_samples_split: 8, n_estimators: 35, name:								
RF, random_state: 27}, sub: {random_state: 27, smo_grp: OVER, type: RandomOver-								
Sampler}} TPE 29 RF ClusterCentroids Under 0.9432								
TPE 29 RF ClusterCentroids Under resampling 0.9432								
{classifier: {bootstrap: True, class_weight: None, criterion: entropy, max_features:								
sqrt, min_samples_leaf: 1, min_samples_split: 6, n_estimators: 142, name: RF, ran-								
dom_state: 29}, sub: {estimator: KMeans, random_state: 29, smo_grp: UNDER, type: ClusterCentroids, voting: hard}}								
TPE 36 KNN ClusterCentroids Under 0.9661								
resampling								
{classifier: {algorithm: kd_tree, n_neighbors: 28, name: KNN, p: 12, random_state: 36,								
weights: distance}, sub: {estimator: MiniBatchKMeans, random_state: 36, smo_grp: UNDER, type: ClusterCentroids, voting: hard}}								
TPE 39 RF EditedNearest Under 0.9432								
Neighbours resampling								
{classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy,								
max_features: sqrt, min_samples_leaf: 1, min_samples_split: 13, n_estimators: 65, name: RF, random_state: 39}, sub: {kind_sel: mode, n_neighbors: 10, smo_grp:								
UNDER, type: EditedNearestNeighbours}}								
TPE 59 RF Neighbourhood Under 0.9404								
CleaningRule resampling								
{classifier: {bootstrap: False, class_weight: None, criterion: entropy, max_features:								
log2, min_samples_leaf: 1, min_samples_split: 19, n_estimators: 66, name: RF,								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}}								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE 79 DT EditedNearest Under 0.9409								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE 79 DT EditedNearest Under 0.9409								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								
random_state: 59}, sub: {n_neighbors: 16, smo_grp: UNDER, threshold_cleaning: 0.23287886649023412, type: NeighbourhoodCleaningRule}} TPE								

TABLE S-24 "YEAST3"

Classifier GM Method Seed Resampler Res.Group Grid SVM ClusterCentroids Under 0.9286 resampling SVM 0.9286 Grid 18 ClusterCentroids Under resampling Grid 27 RF SMOTEENN Combine 0.9287 resampling Grid 29 SVM ClusterCentroids 0.9294 Under resampling Grid 36 RF RandomUnderSampler Under 0.9307 resampling SVM 0.9245 Grid 39 ClusterCentroids Under resampling 0.927 59 SVM Grid ClusterCentroids Under resampling 79 SVM ClusterCentroids 0.9316 Grid Under resampling 90 RF Under 0.9311 Grid RandomUnderSampler resampling 0.9302 Grid 109 SVM ClusterCentroids Under resampling Random DT RandomUnderSampler Under 0.9353 resampling {classifier: {criterion: entropy, max_depth: 2, max_features: None, min_samples_leaf: 4, min_samples_split: 6, name: DTC, random_state: 9}, sub: {random_state: 9, replacement: True, smo_grp: UNDER, type: RandomUnderSampler}} 18 RF ADASYN Random resampling {classifier: {bootstrap: True, class_weight: balanced_subsample, criterion: entropy, max_features: None, min_samples_leaf: 15, min_samples_split: 12, n_estimators: 55, name: RF, random_state: 18}, sub: {n_neighbors: 6, random_state: 18, smo_grp: OVER, type: ADASYN}} 27 ADASYN 0.9397 Random Over resampling {classifier: {bootstrap: True, class_weight: None, criterion: gini, max_features: log2, min_samples_leaf: 15, min_samples_split: 12, n_estimators: 136, name: RF, random_state: 27}, sub: {n_neighbors: 5, random_state: 27, smo_grp: OVER, type: ADASYN}} ADASYN Random Over resampling {classifier: {bootstrap: True, class_weight: None, criterion: entropy, max_features: None, min_samples_leaf: 13, min_samples_split: 2, n_estimators: 95, name: RF, random_state: 29}, sub: {n_neighbors: 4, random_state: 29, smo_grp: OVER, type: ADASYN}} SMOTETomek Random Combine resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: gini, max_features: None, min_samples_leaf: 17, min_samples_split: 4, n_estimators: 15, name: RF, random_state: 36}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTETomek}} BorderlineSMOTE Random Over resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: entropy, max_features: None, min_samples_leaf: 10, min_samples_split: 10, n_estimators: 63, name: RF, random_state: 39}, sub: {k_neighbors: 7, kind: borderline-2, m_neighbors: 9, random_state: 39, smo_grp: OVER, type: BorderlineSMOTE}} 59 ADASYN 0.9401 Random Over resampling {classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: gini, max_features: log2, min_samples_leaf: 19, min_samples_split: 8, n_estimators: 97, name: RF, random_state: 59}, sub: {n_neighbors: 8, random_state: 59, smo_grp: OVER, type: ADASYN}} ADASYN Random 79 RF Over 0.9378 resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: gini, max_features: sqrt, min_samples_leaf: 18, min_samples_split: 7, n_estimators: 127, name: RF,

random_state: 79}, sub: {n_neighbors: 8, random_state: 79, smo_grp: OVER, type:

ADASYN}}

continued on the next column

TABLE S-24 "YEAST3" – CONTINUED FROM PREVIOUS COLUMN

TABLE S-25 "ECOLI3"

Classifier GM Method Seed Resampler Res.Group RF ClusterCentroids 0.9119 Under resampling RF Grid 18 RandomUnderSampler Under 0.9048 resampling Grid 27 SVM AllKNN 0.9034 Under resampling Grid 29 SVM AllKNN 0.9034 Under resampling Grid 36 SVM AllKNN 0.9034 Under resampling 39 SVM AllKNN 0.9034 Grid Under resampling Grid 59 SVM AllKNN Under 0.9034 resampling Grid 79 SVM AllKNN Under 0.9034 resampling AllKNN 0.9034 Grid 90 SVM Under resampling SVM AllKNN 0.9034 109 Grid Under resampling KNN 0.9033 Random Instance Under HardnessThreshold resampling {classifier: {algorithm: kd_tree, n_neighbors: 25, name: KNN, p: 3, random_state: 9, weights: uniform}, sub: {cv: 7, estimator: knn, random_state: 9, smo_grp: UNDER, type: InstanceHardnessThreshold}} Neighbourhood 18 Under SVM Random CleaningRule resampling {classifier: {C: 20.31584877962912, coef0: -0.07360114591616918, degree: 2, gamma: value, gamma_value: 4.648489528361493, kernel: linear, name: SVM, probability: False, random_state: 18, shrinking: True, tol: 0.0038897861244040566}, sub: {n_neighbors: 12, smo_grp: UNDER, threshold_cleaning: 0.4705387865935655, type: $NeighbourhoodCleaningRule \} \, \}$ 0.9017 ClusterCentroids Random 27 RF Under resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: entropy, max_features: None, min_samples_leaf: 4, min_samples_split: 7, n_estimators: 118, name: RF, random_state: 27}, sub: {estimator: KMeans, random_state: 27, smo_grp: UNDER, $type:\ Cluster Centroids,\ voting:\ soft\}\}$ SVMSMOTE Random 29 LR Over penalty_solver: none+lbfgs, random_state: 29, tol: 0.07725375523893797}, sub: {k_neighbors: 3, m_neighbors: 8, out_step: 0.20205889382477793, random_state: 29, smo_grp: OVER, type: SVMSMOTE}} BorderlineSMOTE Random 36 KNN Over 0.9022 resampling {classifier: {algorithm: kd_tree, n_neighbors: 17, name: KNN, p: 16, random_state: $36,\ weights:\ uniform\},\ sub:\ \{k_neighbors:\ 4,\ kind:\ borderline\mbox{-}1,\ m_neighbors:\ 3,$ random_state: 36, smo_grp: OVER, type: BorderlineSMOTE}} Random LR KMeansSMOTE resampling {classifier: {C: 43.2906435494196, 11_ratio: 0.3989314382180151, name: LR, penalty_solver: 12+newton-cg, random_state: 39, tol: 0.011267331180967965}, sub: {cluster_balance_threshold: 0.3247795223180144, k_neighbors: 3, random_state: 39, smo_grp: OVER, type: KMeansSMOTE}} Random 59 RF SMOTE Over 0.9086 resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: entropy, max_features: sqrt, min_samples_leaf: 14, min_samples_split: 7, n_estimators: 137, name: RF, random_state: 59}, sub: {k_neighbors: 9, random_state: 59, smo_grp: OVER, type: SMOTE}} Random RF SMOTE Over 0.9035 resampling {classifier: {bootstrap: True, class_weight: balanced, criterion: gini, max_features: sqrt, min_samples_leaf: 17, min_samples_split: 11, n_estimators: 64, name: RF,

random_state: 79}, sub: {k_neighbors: 2, random_state: 79, smo_grp: OVER, type:

SMOTE \}

continued on the next column

TABLE S-25 "ECOLI3" – CONTINUED FROM PREVIOUS COLUMN

	Seed	Classifier	Resampler	Res.Group	GM
Method Random	90	LR	SVMSMOTE	Over	0.9017
· · · · · · · · · · · · · · · · · · ·	, ,		D THISHIOTE	resampling	0.5017
{classifier:	{C:	39.311402246	52814, 11_ratio:		326321, name: LR,
enalty_sc	olver: 1	2+lbfgs, rand	lom_state: 90, to	ol: 5.48580132	7818933e-05}, sub:
k_neighb	ors: 4, 1	n_neighbors:	5, out_step: 0.292	3079883227417	4, random_state: 90,
smo_grp:	OVER,	type: SVMSN	MOTE}}		
Random	109	KNN	Instance	Under	0.8979
			HardnessThresh		
					, random_state: 109,
				idom_state: 109	, smo_grp: UNDER,
		inessThreshol			0.9049
ГРЕ	9	LR	SVMSMOTE	Over resampling	0.9049
{classifier:	{C: {	35.675131764	63702. 11 ratio:		393047, name: LR,
•					13217643173}, sub:
					64, random_state: 9,
		type: SVMSN			
TPE	18	RF	SMOTETomek	Combine	0.9171
				resampling	
					ntropy, max_features:
					46, name: RF, ran-
					pe: SMOTETomek}}
TPE	27	LR	SVMSMOTE	Over	0.9035
(-1 'C	(C	(0.657020026	21.420 11 ::	resampling	002450 1.5
			21429, 11_ratio:		
			dom_state: 27,		
				050134074217	1, random_state: 27,
TPE		type: SVMSN	SVMSMOTE	Over	0.905
IFE	29	LR	SVINSMOTE	resampling	0.903
{classifier	{C·	1 37 398969968	33583, 11_ratio:	0.39762555408	17645, name: LR,
					577794550107}, sub:
					8, random_state: 29,
		type: SVMSN			-, ,
		type, by wish			
TPE	36	LR	SVMSMOTE	Over	0.9067
TPE	36	LR	SVMSMOTE	resampling	0.9067
TPE {classifier:	36 : {C:	LR 75.697051270	SVMSMOTE 052599, 11_ratio:	0.5742308250	
TPE {classifier: penalty_sc	36 : {C: olver: 12	LR 75.697051270 +newton-cg,	SVMSMOTE 052599, 11_ratio: random_state: 36,	resampling 0.5742308250 tol: 0.0257603	83061, name: LR, 43952625567}, sub:
TPE {classifier: penalty_so {k_neighb}	36 : {C: olver: 12 ors: 8,	LR 75.697051270 +newton-cg, m_neighbors:	SVMSMOTE 052599, 11_ratio: random_state: 36, 4, out_step: 0.771	resampling 0.5742308250 tol: 0.0257603	83061, name: LR, 43952625567}, sub:
TPE {classifier: penalty_sc {k_neighb smo_grp:	36 : {C: olver: 12 ors: 8, OVER,	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN	SVMSMOTE 052599, 11_ratio: random_state: 36, 4, out_step: 0.771 MOTE}}	resampling 0.5742308250 tol: 0.0257603 1541922743583	83061, name: LR, 43952625567}, sub: 7, random_state: 36,
TPE {classifier: penalty_so {k_neighb}	36 : {C: olver: 12 ors: 8,	LR 75.697051270 +newton-cg, m_neighbors:	SVMSMOTE 052599, 11_ratio: random_state: 36, 4, out_step: 0.771	resampling 0.5742308250 tol: 0.0257603 1541922743583	
TPE {classifier: penalty_sc {k_neighb smo_grp: TPE	36 : {C: olver: 12 ors: 8, OVER,	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR	SVMSMOTE 052599, 11_ratio: random_state: 36, 4, out_step: 0.771 4OTE}} SVMSMOTE	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032
TPE {classifier: penalty_so {k_neighb smo_grp: TPE {classifier:	36 : {C: olver: 12 ors: 8, OVER, 39 : {C:	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSM LR 96.667096811	SVMSMOTE	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.94862233273	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032
TPE {classifier: penalty_so {k_neighb smo_grp: TPE {classifier: penalty_so	36 : {C: olver: 12 ors: 8, OVER, 39 : {C: olver: ne	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: ndom_state: 39,	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.94862233273 tol: 0.0127766	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub:
TPE {classifier: penalty_so {k_neighb smo_grp: TPE {classifier: penalty_so {k_neighb	36 : {C: oblver: 12 ors: 8, OVER, 39 : {C: oblver: noors: 3,	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors:	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.94862233273 tol: 0.0127766	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub:
TPE {classifier: penalty_so {k_neighb smo_grp: TPE {classifier: penalty_so {k_neighb smo_grp:	36 : {C: olver: 12 ors: 8, OVER, 39 : {C: olver: n ors: 3, OVER,	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ram_neighbors: type: SVMSN	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: ndom_state: 39, 4, out_step: 0.598 MOTE}	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.94862233273 tol: 0.0127766 3485406741639	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub: 6, random_state: 39,
TPE {classifier: penalty_so {k_neighb smo_grp: TPE {classifier: penalty_so {k_neighb smo_grp:	36 : {C: oblver: 12 ors: 8, OVER, 39 : {C: oblver: noors: 3,	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors:	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.94862233273 tol: 0.0127766 8485406741639 Over	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032
TPE {classifier: penalty_so {k_neighb smo_grp: TPE {classifier: penalty_so {k_neighb smo_grp: TPE	36 (C: olver: 12 ors: 8, oVER, 39 (C: olver: nors: 3, oVER, 59	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE	resampling 0.5742308250 101: 0.0257603 1541922743583 Over resampling 0.94862233273 101: 0.0127766 3485406741639 Over resampling	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub: 6, random_state: 39,
TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: fregenalty_sc {k_neighb smo_grp: TPE {classifier:	36 {C: {C: ors: 8, over, 12 ors: 8, over, 39} {C: {C: over, 39} {C: over, nors: 3, over, 59} {boots}	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE class_weight: balai	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.9486223327: tol: 0.0127766 8485406741639 Over resampling ced, criterion:	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759], sub: 6, random_state: 39, 0.9121 gini, max_features:
TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: log2, min_	36 {C: {C: olver: 12 ors: 8, OVER, 39} : {C: olver: no ors: 3, OVER, 59} {boots_sample}	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, c s_leaf: 8, min	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE class_weight: balan_samples_split: 19	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.94862233272 tol: 0.0127766 3485406741639 Over resampling oved, criterion: 0, n_estimators:	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, ran-
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TPE {classifier: penalty_sc{k_neighb} smo_grp: TPE {classifier: penalty_sc{k_neighb} smo_grp: TPE {classifier: log2, min_ dom_state SMOTE}} TPE {classifier: clog2, min_ dom_state smo_grp: TPE {classifier: penalty_sc	36 {C: ors: 8, OVER, 39 {C: olver: nors: 3, OVER, 59 {boots sample : 59}, 79 {C: olver: no	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, c s_leaf: 8, min sub: {k_neight} LR 21.459489811 one+newton-c	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE class_weight: balan in_samples_split: 19 hbors: 5, random_ SVMSMOTE 88397, 11_ratio: g, random_state: 7	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.94862233277 tol: 0.0127766 3485406741639 Over resampling med, criterion: 0, n_estimators: state: 59, smo Over resampling 0.52875448998 19, tol: 0.08403	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, ran- b_grp: OVER, type: 0.9036 867095, name: LR, 88838647985}, sub:
TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: log2, min, dom_state SMOTE}} TPE {classifier: classifier: classifier: clog2, min, dom_state smo_grp: TPE {classifier: clog2, min, dom_state smo_grp: TPE {classifier: classifier: clog2, min, dom_state smo_grp: TPE {classifier: classifier: clog2, min, dom_state smo_grp: TPE {classifier: classifier: classifi	36 : {C: oliver: 12 ors: 8, 39 : {C: oliver: no ors: 3, OVER, 59 : {boots sample : 59}, 79 : {C: oliver: no ors: 5, 10	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, c s_leaf: 8, mir sub: {k_neighbors: LR LR 21.459489811 one+newton-c, m_neighbors:	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE Blass_weight: balan_samples_split: 19 hbors: 5, random SVMSMOTE 88397, 11_ratio: g, random_state: 7 7, out_step: 0.200	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.94862233277 tol: 0.0127766 3485406741639 Over resampling med, criterion: 0, n_estimators: state: 59, smo Over resampling 0.52875448998 19, tol: 0.08403	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, ran- b_grp: OVER, type: 0.9036 867095, name: LR, 88838647985}, sub:
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TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: log2, min_dom_state sMOTE}} TPE {classifier: penalty_sc {k_neighb smo_grp: TPE	36 : {C: oliver: 12 ors: 8, 39 : {C: oliver: no ors: 3, OVER, 59 : {boots sample : 59}, 79 : {C: oliver: no ors: 5, 10	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, c s_leaf: 8, mir sub: {k_neighbors: LR LR 21.459489811 one+newton-c, m_neighbors:	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE Blass_weight: balan_samples_split: 19 hbors: 5, random SVMSMOTE 88397, 11_ratio: g, random_state: 7 7, out_step: 0.200	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.9486223327: tol: 0.0127766 8485406741639 Over resampling need, criterion: 0, n_estimators: state: 59, smo Over resampling 0.52875448998 19, tol: 0.08403 15978226536005	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759], sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, random_state: 70, per OVER, type: 0.9036
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TPE {classifier: penalty_sc{k_neighb smo_grp: TPE {classifier: penalty_sc{k_neighb smo_grp: TPE {classifier: log2, min, dom_state SMOTE}} TPE {classifier: penalty_sc{k_neighb smo_grp: TPE {classifier: penalty_sc{k_neighb smo_grp: TPE {classifier: penalty_sc{k_neighb smo_grp: TPE {classifier: penalty_sc{k_neighb smo_grp: TPE {classifier:	36 : {C: oliver: 12 ors: 8, OVER, 39 : {C: oliver: nors: 3, OVER, 59 : {boots_sample : 59}, 79 : {C: oliver: nors: 5, OVER, 60 ors: 5, 10 OVER, 90 : {boots_sample : {C: oliver: nors: 5, 10 OVER, 90	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, c s_leaf: 8, min sub: {k_neigi} LR 21.459489811 one+newton-c, m_neighbors: type: SVMSN RF	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: Indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE Bass_weight: balant_samples_split: 19 Indom_state: 5, random_ SVMSMOTE SVMSMOTE 88397, 11_ratio: g, random_state: 7, out_step: 0.200 MOTE} ADASYN class_weight: Non class_weight: Non	resampling 0.5742308250 1541922743583 Over resampling 0.94862233273 1501: 0.0127766 8485406741639 Over resampling need, criterion: 0, n_estimators: _state: 59, smo Over resampling 0.52875448998 90, tol: 0.08403 5978226536005 Over resampling e, criterion: gi	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, random_state: 70, 0.9036 867095, name: LR, 88838647985}, sub: 4, random_state: 79, 0.9 ni, max_features: 1,
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TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: log2, min_dom_state SMOTE}} TPE {classifier: classifier: fclassifier:	36 : {C: oliver: 12 ors: 8, OVER, 39 : {C: oliver: noors: 3, OVER, 59 : {boots sample : 59}, 79 : {C: oliver: no ors: 5, 10 OVER, 90 : {boots sample : 59 }; 79	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, cs s_leaf: 8, mir sub: {k_neighbors: type: SVMSN LR LR 21.459489811 one+newton-cy m_neighbors: type: SVMSN RF strap: False, cs 14, min_sas	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE Plass_weight: balant_samples_split: 19 hbors: 5, random SVMSMOTE 88397, 11_ratio: g, random_state: 7 7, out_step: 0.200 MOTE} ADASYN class_weight: Non imples_split: 4, in	resampling 0.5742308250 tol: 0.0257603 1541922743583	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759], sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, rangrp: OVER, type: 0.9036 667095, name: LR, 88838647985}, sub: 4, random_state: 79, 0.9 ni, max_features: 1, 42, name: RF, ran-
TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: log2, min. dom_state SMOTE}} TPE {classifier: penalty_sc {k_neighb smo_grp: TPE }classifier: penalty_sc {k_neighb smo_grp: TPE	36 : {C: oliver: 12 ors: 8, OVER, 39 : {C: oliver: nors: 3, OVER, 59 : {boots sample : 59}, 79 : {C: oliver: no ors: 5, I OVER, 90 : {boots les_leaf: 90}, }}	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF trap: True, c s_leaf: 8, min sub: {k_neigi} LR 21.459489811 one+newton-c, m_neighbors: type: SVMSN RF sub: {k_neigi}	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE Llass_weight: balan _samples_split: 19 hbors: 5, random_ SVMSMOTE 88397, 11_ratio: g, random_state: 7 7, out_step: 0.200 MOTE} ADASYN Class_weight: Non imples_split: 4, in hbors: 4, random_	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.9486223327: tol: 0.0127766 3485406741639 Over resampling need, criterion: 0, n_estimators: state: 59, smo Over resampling 0.52875448998 9, tol: 0.08403 5978226536005 Over resampling e, criterion: gi _estimators: 14 state: 90, smo	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, random_state: 70, 0.9036 867095, name: LR, 88838647985}, sub: 4, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 70,
TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: penalty_sc {k_neighb smo_grp: TPE {classifier: log2, min_dom_state SMOTE}} TPE {classifier: classifier: fclassifier:	36 : {C: oliver: 12 ors: 8, OVER, 39 : {C: oliver: noors: 3, OVER, 59 : {boots sample : 59}, 79 : {C: oliver: no ors: 5, 10 OVER, 90 : {boots sample : 59 }; 79	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, cs s_leaf: 8, mir sub: {k_neighbors: type: SVMSN LR LR 21.459489811 one+newton-cy m_neighbors: type: SVMSN RF strap: False, cs 14, min_sas	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE Plass_weight: balant_samples_split: 19 hbors: 5, random SVMSMOTE 88397, 11_ratio: g, random_state: 7 7, out_step: 0.200 MOTE} ADASYN class_weight: Non imples_split: 4, in	resampling 0.5742308250 10.0257603 1541922743583 Over resampling 0.94862233273 10.0127766 3485406741639 Over resampling 10.0127766 10.0127766 10.0127766 10.0127766 10.0127766 10.0127766 10.0127766 10.012776 10.01276 10.01276 10.01276 10.01276 10.01276 10.01276 10.01276	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759], sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, rangrp: OVER, type: 0.9036 867095, name: LR, 88838647985}, sub: 4, random_state: 79, 0.9 ni, max_features: 1, 42, name: RF, ran-
classifier:	36 : {C: oliver: 12 ors: 8, OVER, 39 : {C: oliver: no ors: 3, OVER, 59 : {boots sample : 59}, 79 : {C: oliver: no ors: 5, 1 OVER, 90 : {boots sample : {Diver: no ors: 5, 1 OVER, 90 : {boots les_leaf : 90}, }}	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, cs_leaf: 8, mir sub: {k_neighbors: type: SVMSN LR LR LR 21.459489811 one+newton-cy m_neighbors: type: SVMSN RF strap: False, cs_l4, min_sasub: {n_neighbors: type: SVMSN LR LR	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE Plass_weight: balan_samples_split: 19 hbors: 5, random SVMSMOTE 88397, 11_ratio: g, random_state: 7 7, out_step: 0.200 MOTE}} ADASYN class_weight: Non imples_split: 4, in hbors: 4, random SVMSMOTE	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.9486223327: tol: 0.0127766 8485406741639 Over resampling need, criterion: 9, n_estimators: state: 59, smo Over resampling 0.52875448998 9, tol: 0.08403 5978226536005 Over resampling e, criterion: gi _estimators: 14 _state: 90, smo Over resampling	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759], sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, ran-p_grp: OVER, type: 0.9036 867095, name: LR, 88838647985}, sub: 4, random_state: 79, 0.9 ni, max_features: 1, 12, name: RF, ran-p_grp: OVER, type: 0.9049
classifier: classifier: classifier: classifier: classifier: classifier: cog2, min. dom_state smo_grp: TPE classifier:	36 : {C: oliver: 12 ors: 8, OVER, 39 : {C: oliver: nors: 3, OVER, 59 : {boots sample : 59}, 79 : {C: oliver: nors: 3, OVER, 90 : {C: oliver: nors: 3, OVER, 100 ors: 5, 1 OVER, 90 : {boots else_leaf : 90}, }}	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF strap: True, cs s_leaf: 8, mir sub: {k_neightors: type: SVMSN RF LR 21.459489811 LR 21.459489811 strap: False, cs m_neighbors: type: SVMSN RF strap: True, cs s_leaf: 8, mir sub: {k_neightors: type: SVMSN RF LR 21.459489811 LR 4.480362014	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77 MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE Plass_weight: balant_samples_split: 19 hbors: 5, random_state: 7 7, out_step: 0.200 MOTE} ADASYN Class_weight: Non imples_split: 4, in hbors: 4, random_ SVMSMOTE	resampling 0.5742308250 tol: 0.0257603 tol: 0.0257603 tol: 0.0257603 tol: 0.0257603 tol: 0.0127766 tol: 0.012776 tol: 0.01277	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759], sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, ran- 52, rane: LR, 88838647985}, sub: 4, random_state: 79, 0.9 ni, max_features: 1, 42, name: RF, ran- 52, grp: OVER, type: 0.9049 375266, name: LR, 0.9049
(classifier: penalty_sc(k_neighb) penalty_sc(k_neig	36 {C: oliver: 12 ors: 8, OVER, 39 {C: oliver: nors: 3, OVER, 59 {boots sample : 59}, 79 {C: oliver: no ors: 5, 10 OVER, 90 {boots les_leaf: : 90}, } 109 {C: oliver: 12	LR 75.697051270 +newton-cg, m_neighbors: type: SVMSN LR 96.667096811 one+lbfgs, ra m_neighbors: type: SVMSN RF trap: True, c s_leaf: 8, min sub: {k_neigi} LR 21.459489811 one+newton-c m_neighbors: type: SVMSN RF sub: {k_neigi} LR 21.459489811 one+newton-c m_neighbors: type: SVMSN LR LR LR 4.380362014 +newton-cg, squares sub: {n_neigi}	SVMSMOTE D52599, 11_ratio: random_state: 36, 4, out_step: 0.77! MOTE} SVMSMOTE 27165, 11_ratio: indom_state: 39, 4, out_step: 0.598 MOTE} SMOTE class_weight: balant_samples_split: 19 hbors: 5, random_ SVMSMOTE 88397, 11_ratio: g, random_state: 7, out_step: 0.200 MOTE} ADASYN class_weight: Non imples_split: 4, in hbors: 4, random_ SVMSMOTE SVMSMOTE 182275, 11_ratio: random_state: 109	resampling 0.5742308250 tol: 0.0257603 1541922743583 Over resampling 0.9486223327: tol: 0.0127766 3485406741639 Over resampling need, criterion: 0, n_estimators: state: 59, smo Over resampling 0.52875448998 9, tol: 0.08403 5978226536005 Over resampling e, criterion: gi estimators: 14 state: 90, smo Over resampling 0.8320092804 t, tol: 0.017205	83061, name: LR, 43952625567}, sub: 7, random_state: 36, 0.9032 882934, name: LR, 38398823759}, sub: 6, random_state: 39, 0.9121 gini, max_features: 52, name: RF, random_state: 70, 0.9036 867095, name: LR, 88838647985}, sub: 4, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 79, 0.9 mi, max_features: 1, 12, name: RF, random_state: 70,

TABLE S-26 "PAGE-BLOCKSO"

Classifier Resampler GM Method Seed Res.Group RF 0.9356 Grid Instance Under HardnessThreshold resampling 0.9395 18 RF Grid Under Instance HardnessThreshold resampling 27 RF 0.935 Grid Under Instance HardnessThreshold resampling Grid 29 RF Instance Under 0.9385 HardnessThreshold resampling 36 RF 0.941 Grid RandomUnderSampler Under resampling 39 RF 0.9477 Grid RandomUnderSampler Under resampling Grid 59 RF RandomUnderSampler 0.942 Under resampling Grid 79 RF 0.9425 RandomUnderSampler Under resampling 90 RF 0.9412 Grid Instance Under HardnessThreshold resampling Grid 109 RF 0.9384 Instance Under HardnessThreshold resampling Random RF ADASYN Over 0.9425 resampling

{classifier: {bootstrap: True, class_weight: balanced, criterion: entropy, max_features: 1, min_samples_leaf: 19, min_samples_split: 10, n_estimators: 128, name: RF, random_state: 9}, sub: {n_neighbors: 6, random_state: 9, smo_grp: OVER, type: ADASYN}} Random 18 ADASYN Over

				resampling				
{classifier:	: {boots	trap: False, c	class_weight: balanced, cr	riterion: gini, r	nax_features:			
1, min_samples_leaf: 13, min_samples_split: 14, n_estimators: 108, name: RF, ran-								
dom state: 18}, sub: {n neighbors: 8, random state: 18, smo grp: OVER, type:								
ADASYN}}								
Random	27	RF	ADASYN	Over	0.9434			

resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: 1, min_samples_leaf: 14, min_samples_split: 12, n_estimators: 87, name: RF, random_state: 27}, sub: {n_neighbors: 9, random_state: 27, smo_grp: OVER, type: ADASYN}}

	,,								
Random	29	RF	Neighbourhood	Under	0.9407				
			CleaningRule	resampling					
{classifier	{classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: entropy,								
max_featu	ires: sqrt	, min_sampl	es_leaf: 19, min_samples_	_split: 19, n_es	stimators: 41,				
name: RF	randor,	n_state: 29},	sub: {n_neighbors: 10,	smo_grp: UNI	DER, thresh-				
old cleani	no: 0.13	52064404854	12885 type: Neighbourhoo	dCleaningRule	11				

AllKNN

36

Random

resampling {classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: entropy, max_features: 1, min_samples_leaf: 10, min_samples_split: 19, n_estimators: 81, name: RF, random_state: 36}, sub: {allow_minority: True, kind_sel: all, n_neighbors: 11,

smo_grp:	UNDEK	, type: AllKN	NIN } }		
Random	39	RF	RandomUnderSampler	Under	0.9416
				recompling	

max_features: log2, min_samples_leaf: 1, min_samples_split: 15, n_estimators: 134, name: RF, random_state: 39}, sub: {random_state: 39, replacement: False, smo_grp: UNDER, type: RandomUnderSampler}}

0 - 1	., p		······································		
Random	59	RF	Neighbourhood	Under	0.9407
			CleaningRule	resampling	
{classifier:	: {boots	trap: Fal	se, class_weight: balanced	_subsample, criter	rion: entropy,

max_features: 1, min_samples_leaf: 9, min_samples_split: 4, n_estimators: 79, name: RF, random_state: 59}, sub: {n_neighbors: 7, smo_grp: UNDER, threshold_cleaning: 0.7668093596046256, type: NeighbourhoodCleaningRule}}
Random | 79 | RF | EditedNearest

Random	1//	ICI	Lancartear	CSL	Cildei	0.7733
			Neighbours	i	resampling	
{classifier:	: {boots	trap: False,	class_weight:	balanced_su	bsample, criter	rion: entropy,
max featu	res 1 n	nin samples	leaf: 3 min c	amples splits	17 n estimato	rs: 78 name:

RF, random_state: 79}, sub: {kind_sel: all, n_neighbors: 18, smo_grp: UNDER, type: EditedNearestNeighbours \} \}

continued on the next column

Under

TABLE S-26 "PAGE-BLOCKSO" - CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	Neighbourhood	Under	0.9426
			CleaningRule	resampling	
			class_weight: balanced, c		
			nin_samples_split: 9, n_		
			eighbors: 11, smo_grp: UighbourhoodCleaningRule		oid_cleaning:
Random	109	RF	ADASYN	Over	0.944
Rundom	10)	10	ADAISTI.	resampling	0.511
{classifier:	{boots	trap: True,	class_weight: balanced_su		ion: entropy,
RF, randor	m_state:		eaf: 15, min_samples_split n_neighbors: 3, random_s		
TPE ADA	9 9	RF	Neighbourhood	Under	0.9437
	_	10	CleaningRule	resampling	0.5137
{classifier:	{boots	trap: False,	class_weight: balanced_su		rion: entropy,
			les_leaf: 1, min_samples_		
			sub: {n_neighbors: 15,		
			36067, type: Neighbourhoo		
TPE	18	RF	RandomUnderSampler	Under	0.9415
{classifier	{ hoots	tran: True (class_weight: balanced, co	resampling	nax features:
			n_samples_split: 9, n_esti		
	: 18}, sı	ub: {random_	state: 18, replacement: Tr		
TPE	27	RF	AllKNN	Under	0.9433
				resampling	
			class_weight: balanced_		
			les_leaf: 19, min_sample:		
			sub: {allow_minority: True	e, kind_sel: all,	n_neignbors:
TPE	1p. UNI 29	DER, type: A	Neighbourhood	Under	0.9457
11.L	2)	l Ki	CleaningRule	resampling	0.5437
{classifier:	{bootst	rap: False, cl	ass_weight: balanced, crite	erion: entropy, 1	max_features:
			n_samples_split: 9, n_esti		
			ghbors: 12, smo_grp: U		old_cleaning:
			eighbourhoodCleaningRul		0.0475
TPE	36	RF	AllKNN	Under resampling	0.9475
{classifier:	{boots	trap: False.	class_weight: balanced_su		rion: entropy.
			leaf: 2, min_samples_split:		
			allow_minority: False, kir	nd_sel: all, n_n	eighbors: 15,
		type: AllKi			
TPE	39	RF	AllKNN	Under	0.9484
{classifier	{hoots	tran: False	class_weight: balanced, c	resampling	max features:
			samples_split: 12, n_estir		
	: 39}, sı	ub: {allow_m	inority: True, kind_sel: all		
TPE	59	RF	RepeatedEdited	Under	0.9487
(alaa-!-	(1 ₁	oteom. F-1.	NearestNeighbours	resampling	itanian: -: '
			<pre>class_weight: balanced_ leaf: 7, min_samples_split</pre>		
			cind_sel: all, n_neighbors:		
		arestNeighbo		s, smo_grp. o	, type.
TPE	79	RF	Neighbourhood	Under	0.9461
			CleaningRule	resampling	
			ass_weight: balanced, crite		
			samples_split: 4, n_estim		
			ghbors: 17, smo_grp: U eighbourhoodCleaningRul		oid_cleaning:
TPE	90	RF	ADASYN	Over	0.9461
11.12	20	IXI.	ADASIN	resampling	0.9401
{classifier:	{boots	trap: False,	class_weight: None, criter		max_features:
			_samples_split: 6, n_estin		
dom_state:		sub: {n_neig	hbors: 9, random_state:	90, smo_grp:	OVER, type:
TPE	109	RF	Neighbourhood CleaningRule	Under resampling	0.9456
{classifier	{hoot	stran: False	class_weight: balanced_		iterion: gini,
			leaf: 7, min_samples_split		
			_neighbors: 12, smo_grp:		
			ghbourhoodCleaningRule}		

TABLE S-27 "YEAST-2_VS_4"

TABLE S-27 "YEAST-2_VS_4" – CONTINUED FROM PREVIOUS COLUMN

						Method	Seed	Classifier	Resampler	Res.Group	GM
Method	Seed	Classifier	Resampler	Res.Group	GM	Random	90	RF	Instance	Under	0.9403
Grid	9	DT	Instance	Under	0.9442	(-1'£	. (1	T	HardnessThreshold	resampling	6
0.1	10		HardnessThreshold	resampling	0.0270				ss_weight: balanced, crite _samples_split: 16, n_estin		
Grid	18	DT	Instance	Under	0.9279				imator: gradient-boosting,		
Grid	27	DT	HardnessThreshold ClusterCentroids	resampling Under	0.9383			stanceHardnes		random_state.	yo, omo_grp.
Ond	21	DI	Cluster Centrolus	resampling	0.7303	Random	109	DT	Instance	Under	0.9419
Grid	29	DT	Neighbourhood	Under	0.9393				HardnessThreshold	resampling	
			CleaningRule	resampling					_depth: 13, max_features:		
Grid	36	DT	Instance	Under	0.9477				C, random_state: 109}, sub		
0:1	20	DE	HardnessThreshold	resampling	0.0206		random_		no_grp: UNDER, type: Ins		
Grid	39	RF	RandomUnderSampler	Under	0.9396	TPE	9	RF	RepeatedEdited NearestNeighbours	Under	0.9692
Grid	59	RF	RandomUnderSampler	resampling Under	0.9344	{classifier	· {bootst	ran: False cl:	ass_weight: None, criterion	resampling	atures: None
O.i.u	0,		randomendersampier	resampling	0.55.1				les_split: 2, n_estimators: (
Grid	79	DT	Instance	Under	0.9392				ors: 12, smo_grp: UNDER		
			HardnessThreshold	resampling		estNeighb	ours}}	0			
Grid	90	DT	Instance	Under	0.9557	TPE	18	RF	SMOTE	Over	0.9477
Cit	100	RF	HardnessThreshold	resampling	0.025					resampling	
Grid	109	KF	ClusterCentroids	Under resampling	0.935				class_weight: balanced_s		
Random	Random 9 RF CondensedNearest Under 0.949 max_features: None, min_samples_leaf: 18, min_samples_split: 2, n_estimators: 14 name: RF, random_state: 18}, sub: {k_neighbors: 7, random_state: 18, smo_grp: OVEI										
			Neighbour	resampling		type: SM0		_state. 10}, su	b. {k_neighbors. /, randon	_state. 16, sinc	gip. OVEK,
{classifier:	{boots	trap: False, c	lass_weight: None, criter		nax_features:	TPE	27	DT	Neighbourhood	Under	0.951
			_samples_split: 3, n_esti			III L	21	101	CleaningRule	resampling	0.551
			ors: 46, n_seeds_S: 37,	random_state:	9, smo_grp:	{classifier	: {criteri	on: entropy, n	nax_depth: 14, max_feature		samples_leaf:
			stNeighbour}}						ne: DTC, random_state:		
Random	18	RF	SMOTEENN	Combine	0.9455	smo_grp:	UNDER	threshold_c	leaning: 0.6411390082502	2698, type: Ne	ighbourhood-
[alossifier	(boote	tran: Trua a	lass_weight: balanced_sul	resampling	ion: ontrony	CleaningF					
			es_leaf: 18, min_samples			TPE	29	RF	RandomUnderSampler	Under	0.9489
			sub: {random_state: 18,			(alassifian	u (hootet	mam. Falsa ak	ass weight: balanced, crite	resampling	may faatumaa
SMOTEEN		,		-8-F:	, -,,-,-		•	1	nin_samples_split: 16, n_	10/	_
Random	27	DT	Neighbourhood	Under	0.9499				om_state: 29, replacement		
			CleaningRule	resampling				erSampler}}	m_state. 25, replacement	. 1 4150, 51110_5	,.p. or.bbr.,
			nax_depth: 13, max_feature			TPE	36	RF	Instance	Under	0.9601
			e: DTC, random_state: 2						HardnessThreshold	resampling	
		, threshold_cl	eaning: 0.1667444518523	2178, type: Ne	ighbourhood-				ass_weight: balanced, crite		
CleaningR Random	29	RF	RepeatedEdited	Under	0.9488				nin_samples_split: 17, n_		
Kandom	29	KI	NearestNeighbours	resampling	0.9466				estimator: decision-tree,	random_state:	36, smo_grp:
{classifier:	{boots	trap: False, c	lass_weight: balanced_su		rion: entropy,	TPE	1ype: Ins	tanceHardnes RF	RandomUnderSampler	Under	0.9535
			oles_leaf: 2, min_samples			IPE	39	Kr	KandomOnderSampler	resampling	0.9333
			ib: {kind_sel: all, n_neight			{classifier	: {boots	tran: False, c	lass_weight: balanced, cr		max features:
		tedNearestNei							in_samples_split: 16, n_e		
Random	36	RF	RandomUnderSampler	Under	0.95		ate: 39}, sub: {random_state: 39, replacement: False, smo_grp: UNDER,				
(1 :0	(1	F 1	1 11 1	resampling	6 1			erSampler}}			
			lass_weight: balanced, cr			TPE	59	RF	TomekLinks	Under	0.9621
			_samples_split: 11, n_esti state: 36, replacement: Tru			(1 :6	(1 .	F.1	1 11 1 1 1	resampling	<u> </u>
RandomU:			state. 50, replacement. 110	ic, smo_grp. c	TUDER, type.				elass_weight: balanced_sules_leaf: 11, min_samples		
Random	39	DT	RandomUnderSampler	Under	0.9535				ub: {smo grp: UNDER, ty		
				resampling		TPE	79	RF	No	No	0.9564
			x_depth: 11, max_feature			III L	'	l Ki	resampling	resampling	0.2304
7, min_sa	mples_sp	olit: 17, name	e: DTC, random_state: 39	9}, sub: {rande	om_state: 39,	{classifier	: {boots	trap: False, c	class_weight: balanced_sul	bsample, criter	ion: entropy,
			NDER, type: RandomUnd			max_featu	ires: log2	2, min_sample	es_leaf: 12, min_samples_	split: 10, n_est	imators: 110,
Random	59	DT	RepeatedEdited	Under	0.9533	name: RF	, random	_state: 79}, s	ub: {smo_grp: NO, type: l	NO}}	
(alassifian	Comitoni		NearestNeighbours nax depth: 17, max feature	resampling	aammiaa laafi	TPE	90	RF	AllKNN	Under	0.9582
			ne: DTC, random_state:			(1 :0				resampling	
			DER, type: RepeatedEdited						ass_weight: None, criterion		
Random	79	DT	CondensedNearest	Under	0.9416		_		les_split: 7, n_estimators:		_
			Neighbour	resampling		type: Allk		iiiiioiity: 1ru	e, kind_sel: all, n_neighb	ль. 1 <i>э</i> , smo_g	ip. UNDEK,
{classifier:	{criter	ion: gini, ma	x_depth: 8, max_features		samples_leaf:	TPE	109	RF	Instance	Under	0.9521
			ne: DTC, random_state: 7						HardnessThreshold	resampling	3.7321
	: 47, rar	ndom_state: 7	9, smo_grp: UNDER, typ	e: CondensedN	NearestNeigh-	{classifier	: {bootst	rap: False, cla	ass_weight: balanced, crite		nax_features:
bour}}				1 1		None, mi	in_sampl	es_leaf: 8, n	nin_samples_split: 10, n_	estimators: 68	, name: RF,
			conti	nued on the	next column				estimator: knn, random_st	ate: 109, smo_s	grp: UNDER,
						type: Insta	anceHard	InessThreshol	d}}		

TABLE S-28 "YEAST-0-5-6-7-9_VS_4"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	RF	Instance	Under	0.7876
~	1.0		HardnessThreshold	resampling	
Grid	18	SVM	RandomUnderSampler	Under	0.7797
0:1	27	D.M.	C) (OFFERDA	resampling	0.7020
Grid	27	DT	SMOTEENN	Combine	0.7928
~	• • •			resampling	
Grid	29	RF	SMOTEENN	Combine	0.7698
0.1	26	DE	D 1 II I C 1	resampling	0.0077
Grid	36	RF	RandomUnderSampler	Under	0.8077
Grid	39	RF	RandomUnderSampler	resampling Under	0.8242
Giiu	39	KI.	Kandomondersampler	resampling	0.6242
Grid	59	RF	SMOTEENN	Combine	0.7975
Ond		IXI	SMOTEENIN	resampling	0.7773
Grid	79	RF	RandomUnderSampler	Under	0.7967
Ona	' '	TG.	randomendersampier	resampling	0.7507
Grid	90	RF	RandomUnderSampler	Under	0.7921
Ona	'0	10	randomendersampier	resampling	0.7521
Grid	109	DT	RandomUnderSampler	Under	0.7901
				resampling	
Random	9	RF	AllKNN	Under	0.8084
	'			resampling	
{classifier	: {bootst	rap: True. cla	ass_weight: balanced, crite		nax features
			nin_samples_split: 13, n_		
			minority: True, kind_sel: a		
UNDER,			.,		,
Random	18	RF	SMOTEENN	Combine	0.8202
	••			resampling	0.0202
{classifier	· {boots	tran: False o	class_weight: None, criter		nax features
			n_samples_split: 7, n_esti		
dom state	: 18}. sı	ib: {random :	state: 18, smo_grp: COME	BINE, type: SM	IOTEENN}}
Random	27	DT	SMOTETomek	Combine	0.7982
rundom		DI.	SMOTETONICK	resampling	0.7702
smo_grp:	COMBI	NE, type: SM	e: DTC, random_state: 2' IOTETomek}}		
Random	29	RF	Neighbourhood	Under	0.8234
[alossifian	· (boots	tron: Folco	CleaningRule class_weight: balanced_su	resampling	ion: ontrony
			les_leaf: 13, min_samples		
			sub: {n_neighbors: 11,		
			037, type: Neighbourhood		
Random	ng: 0.32	SVM	Neighbourhood	Under	0.7962
randoni	30	S V IVI	CleaningRule	resampling	0.7902
I classifier	. JC · 17	1635555267	7487, coef0: 0.959505178		e 4 gamma
			9098923641, kernel: line		
			shrinking: False, tol: 0.		
			IDER, threshold_cleaning:		
		silio_grp: UN aningRule}}	DER, unesholu_cleaning:	0.54/14443030	333600, type
			ChatarCantualda	Under	0.0102
Random	39	DT	ClusterCentroids		0.8102
(alassific	 	on: ontron:	may danth: 10 may fort	resampling	oomnlaa la-f
			max_depth: 19, max_featu		
			e: DTC, random_state: 39		
			DER, type: ClusterCentro		
Random	59	RF	Neighbourhood	Under	0.8011
(1	(1		CleaningRule	resampling	<u> </u>
			class_weight: balanced_		
			les_leaf: 10, min_samples		
name: RF	, randoi	n_state: 59},	sub: {n_neighbors: 19,	smo_grp: UNI	DER, thresh-
			5534, type: Neighbourhoo		
Random	79	RF	EditedNearest	Under	0.8012
, ,	L		Neighbours	resampling	
{classifier					
			ass_weight: balanced, crite		
	n_sampl	es_leaf: 12,	min_samples_split: 5, n_	estimators: 129	, name: RF
	n_sampl	es_leaf: 12,		estimators: 129	, name: RF
	n_sampl ate: 79}	es_leaf: 12, , sub: {kind	min_samples_split: 5, n_	estimators: 129	, name: RF,

continued on the next column

Random	Seed	Classifier	Resampler	Res.Group	GM
	90	RF	ClusterCentroids	Under	0.7977
(-1:6	. (14	F-1	.1	resampling	
			class_weight: balanced_su les_leaf: 9, min_samples_		
			sub: {estimator: KMeans,		
			s, voting: hard}}		
Random	109	LR	Neighbourhood	Under	0.806
(alassifian	(C) 1	0.190127656	CleaningRule 411635, 11_ratio: 0.5887	resampling	nomo. I D
			dom_state: 109, tol: 0.0		
			DER, threshold_cleaning:		
		aningRule}}			
TPE	9	RF	Neighbourhood CleaningRule	Under	0.8175
{classifier	: {boots	tran: False. o	class_weight: balanced_su	resampling bsample, criter	ion: entropy
			es_leaf: 12, min_samples		
			sub: {n_neighbors: 5,		
			093, type: Neighbourhood		
TPE	18	RF	AliKNN	Under resampling	0.8296
{classifier	: {boots	trap: False, o	 class_weight: balanced_su		ion: entropy
max_featu	res: Nor	ne, min_samp	les_leaf: 2, min_samples_	split: 16, n_est	imators: 112
			ub: {allow_minority: False	e, kind_sel: all,	n_neighbors
6, smo_gr TPE	p: UNDI 27	ER, type: All	KNN}} Neighbourhood	Under	0.8124
		5,111	CleaningRule	resampling	0.012
			4872, coef0: -0.729961643	39604879, degre	
, ,	_		0222173, kernel: linear, na	/ L	-
			se, tol: 0.08686798620113 leaning: 0.0959909305438		
Silio_grp. CleaningR		, uncsnoid_ci	icannig. 0.0939909303430	0019, type. Ne.	igiibouiiioou
TPE	29	RF	SMOTE	Over	0.8279
				resampling	
			class_weight: None, criter		
			min_samples_split: 2, n_ighbors: 9, random_state:		
SMOTE}		, sub. (K_ne.	ignoors. 9, random_state.	25, sino_grp.	O TEIR, type
TPE	36	SVM	Neighbourhood	Under	0.8146
(-1:6	(C: 20)	00(70(27224	CleaningRule	resampling	1
			082, coef0: -0.2111931569 9469727934, kernel: line		
	iunaon	n_state: 36,	shrinking: True, tol: 0.		54087}, sub
	ors: 18, s	smo_grp: UN	DER, threshold_cleaning: 0		
Neighbou	ors: 18, s	smo_grp: UN aningRule}}	DER, threshold_cleaning:	0.19001385345	311106, type
	ors: 18, s	smo_grp: UN	DER, threshold_cleaning: (EditedNearest	0.19001385345	311106, type
Neighbour TPE {classifier	rhoodCle	smo_grp: UN eaningRule}} DT ion: gini, ma	DER, threshold_cleaning: (EditedNearest Neighbours ax_depth: 10, max_featur	Under resampling res: sqrt, min_s	0.8183 0.8183 samples_leaf
Neighbour TPE {classifier 5, min_sa	rhoodCle 39 : {criteriamples_s	smo_grp: UNleaningRule}} DT ion: gini, maplit: 12, nai	DER, threshold_cleaning: EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state:	Under resampling res: sqrt, min_s 39}, sub: {1	0.8183 0.8183 samples_leaf
Neighbour TPE {classifier 5, min_sa n_neighbo	rhoodCle 39 : {criter: amples_s ors: 18, s	smo_grp: UNl aningRule}} DT ion: gini, maplit: 12, nar mo_grp: UNI	DER, threshold_cleaning: EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest	Under resampling res: sqrt, min_s 39}, sub: {INeighbours}}	0.8183 samples_leaf cind_sel: all
Neighbour TPE {classifier 5, min_sa	rhoodCle 39 : {criteriamples_s	smo_grp: UNleaningRule}} DT ion: gini, maplit: 12, nai	DER, threshold_cleaning: (EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest(EditedNearest)	Under resampling res: sqrt, min_ 39}, sub: {I Neighbours}}	0.8183 samples_leaf cind_sel: all
Neighbour TPE {classifier 5, min_sa n_neighbour TPE	ors: 18, s rhoodCle 39 : {criteriamples_s ors: 18, s	smo_grp: UN caningRule}} DT ion: gini, ma pplit: 12, nai mo_grp: UNI	DER, threshold_cleaning: EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest	Under resampling res: sqrt, min_; 39}, sub: { Neighbours} Under resampling	0.8183 0.8183 samples_leaf cind_sel: all 0.8263
Neighbour TPE {classifier 5, min_sa n_neighbour TPE {classifier max_featu	ors: 18, s rhoodCle 39 : {criteri amples_s ors: 18, s 59 : {boots tres: sqrt,	smo_grp: UNl- caningRule}} DT ion: gini, ma plit: 12, nau mo_grp: UNI RF strap: False, min_samples	EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest EditedNearest Neighbours class_weight: balanced_s_leaf: 5, min_samples_spl	Under resampling es: sqrt, min_s 39}, sub: {I Neighbours}} Under resampling subsample, cr it: 9, n_estimato	0.818: samples_leaf kind_sel: all 0.826: iterion: gini ors: 74, name
Neighbour TPE {classifier 5, min_sa n_neighbour TPE {classifier max_featu RF, rando	ors: 18, s rhoodCle 39 : {criter amples_s ors: 18, s 59 : {boots ares: sqrt, m_state:	smo_grp: UN: aningRule}} DT ion: gini, maplit: 12, naimo_grp: UNI RF strap: False, min_samples 59}, sub: {ki	DER, threshold_cleaning: EditedNearest Neighbours xx_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest EditedNearest Neighbours class_weight: balanced_	Under resampling es: sqrt, min_s 39}, sub: {I Neighbours}} Under resampling subsample, cr it: 9, n_estimato	0.818: samples_leaf kind_sel: all 0.826: iterion: gini ors: 74, name
Neighbour TPE {classifier 5, min_sa n_neighbour TPE {classifier max_featu RF, rando EditedNea	ors: 18, s choodCle 39 : {criter: amples_s ors: 18, s 59 : {boots ures: sqrt, m_state: urestNeig	smo_grp: UN! aningRule}} DT ion: gini, ma plit: 12, nar mo_grp: UN! RF strap: False, min_samples 59], sub: {ki hbours}}	DER, threshold_cleaning: 0 EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest EditedNearest Neighbours class_weight: balanced_s_leaf: 5, min_samples_spl ind_sel: all, n_neighbors:	Under resampling es: sqrt, min_39}, sub: { Neighbours} Under resampling subsample, crit: 9, n_estimate 15, smo_grp: U	0.8183 samples_leaf kind_sel: all 0.8263 deterion: gini prs: 74, name NDER, type
Neighbour TPE {classifier 5, min_sa n_neighbour TPE {classifier max_featu RF, rando EditedNea	ors: 18, s rhoodCle 39 : {criter amples_s ors: 18, s 59 : {boots ares: sqrt, m_state:	smo_grp: UN: aningRule}} DT ion: gini, maplit: 12, naimo_grp: UNI RF strap: False, min_samples 59}, sub: {ki	DER, threshold_cleaning: EditedNearest Neighbours ax_depth: 10, max_feature DTC, random_state: DER, type: EditedNearest EditedNearest Neighbours class_weight: balanced_s_leaf: 5, min_samples_spl ind_sel: all, n_neighbors: Neighbourhood	Under resampling es: sqrt, min_s 39}, sub: {I Neighbours}} Under resampling subsample, cr it: 9, n_estimato	0.818: amples_leaf kind_sel: all 0.826: atterion: gini brs: 74, name NDER, type
Neighbour TPE {classifier 5, min_sa n_neighbo TPE {classifier max_featu RF, rando EditedNea TPE {classifier	ors: 18, s choodCle 39 : {criter amples_s rs: 18, s 59 : {boots rest Sqrt, m_state: rrestNeig 79 : {boots : {boots	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nai mo_grp: UNI RF strap: False, min_samples 59}, sub: {ki hbours}} RF trap: False, o	DER, threshold_cleaning: (EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest! EditedNearest Neighbours class_weight: balanced_s_leaf: 5, min_samples_spl ind_sel: all, n_neighbors: Neighbourhood CleaningRule class_weight: balanced_suelss_weight: balanced_suelss_weight: balanced_suelss_weight: balanced_suelss_weight: balanced_suelss_weight: balanced_suels.	Under resampling es: sqrt, min_s 39}, sub: {INeighbours}} Under resampling subsample, crit: 9, n_estimate 15, smo_grp: Under resampling bsample, criter, crite	0.8183 samples_leaf cind_sel: all 0.8263 iterion: gini ors: 74, name NDER, type 0.8262 ion: entropy
Neighbour TPE {classifier 5, min_si n_neighbour TPE {classifier max_featu RF, rando EditedNea TPE {classifier max_featu RE, rando EditedNea RE, rando EditedNea RE, rando	ors: 18, s choodCle 39 : {criter amples_s ors: 18, s 59 : {boots crestNeig 79 : {boots crestNois	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nan mo_grp: UNI RF strap: False, min_samples 59}, sub: {ki hbours}} RF trap: False, ce ne, min_samples	DER, threshold_cleaning: (EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest Reighbours class_weight: balanced_s_leaf: 5, min_samples_spl ind_sel: all, n_neighbors: Neighbourhood CleaningRule class_weight: balanced_sues_leaf: 17, min_samples	Under resampling es: sqrt, min.; 39}, sub: {I Neighbours} Under resampling subsample, crit: 9, n_estimate 15, smo_grp: Under resampling bample, criter ;_split: 4, n_est	0.8183 samples_leaf kind_sel: all 0.8263 sterion: gini prs: 74, name NDER, type 0.8262 sion: entropy simators: 112
Neighboun TPE {classifier 5, min_san_neighboun TPE {classifier max_featu RF, rando EditedNea TPE {classifier max_featu name: RF	ors: 18, schoodCle 39 : {criter: amples_s ors: 18, s 59 : {boots ures: Sqrt, m_state: urestNeig 79 : {boots ures: Nor c, randor	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nan mo_grp: UNI RF strap: False, min_samples 59}, sub: {ki hbours} RF trap: False, one, min_samp m_state: 79}	DER, threshold_cleaning: (EditedNearest Neighbours	Under resampling es: sqrt, min 39}, sub: {I Neighbours}} Under resampling subsample, crit: 9, n_estimate 15, smo_grp: U Under resampling baample, criter _split: 4, n_est smo_grp: UNI	0.8183 samples_leaf kind_sel: all 0.8263 iterion: gini prs: 74, name NDER, type 0.8262 iterion: entropy imators: 112 DER, thresh
Neighboun TPE {classifier 5, min_si n_neighbo TPE {classifier max_featu RF, rando EditedNea TPE {classifier max_featu name: RF, lod_cleani	ors: 18, schoodCle 39 : {criter: amples_s ors: 18, s 59 : {boots ures: Sqrt, m_state: urestNeig 79 : {boots ures: Nor c, randor	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nan mo_grp: UNI RF strap: False, min_samples 59}, sub: {ki hbours} RF trap: False, one, min_samp m_state: 79}	DER, threshold_cleaning: (EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest EditedNearest Neighbours class_weight: balanced_s leaf: 5, min_samples_spl ind_sel: all, n_neighbors: Neighbourhood CleaningRule class_weight: balanced_su les_leaf: 17, min_samples, sub: {n_neighbors: 5, 284, type: Neighbourhood}	Under resampling es: sqrt, min 39}, sub: {I Neighbours}} Under resampling subsample, crit: 9, n_estimate 15, smo_grp: U Under resampling baample, criter _split: 4, n_est smo_grp: UNI	0.8183 samples_leaf kind_sel: all 0.8263 iterion: gini prs: 74, name NDER, type 0.8262 ion: entropy imators: 112 DER, thresh-
Neighbour TPE {classifier 5, min_s; n_neighbour TPE {classifier max_featu RF, rando EditedNea TPE {classifier max_featu name: RF old_cleani TPE	ors: 18, s choodCle 39 : {criter amples_s ors: 18, s 59 : {boots ress: sqrt, m_state: urestNeig 79 : {boots ress: Nor r, randor ng: 0.45	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nan mo_grp: UNI RF strap: False, min_samples 59}, sub: {ki hbours}} RF trap: False, c e, min_samp _state: 79}, 62349522895	DER, threshold_cleaning: 0 EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest EditedNearest Neighbours class_weight: balanced_s_leaf: 5, min_samples_spl ind_sel: all, n_neighbors: Neighbourhood CleaningRule class_weight: balanced_suejheit: balanced_suejheit: balanced_suejheit: balanced_suejheit: 17, min_samples, sub: {n_neighbors: 5, 284, type: Neighbourhood} RandomUnderSampler	Under resampling es: sqrt, min; 39}, sub: {I Neighbours}} Under resampling subsample, crit: 9, n_estimate 15, smo_grp: Under resampling subsample, crit: 4, n_est smo_grp: UNICleaningRule} Under resampling brample, criter symbols sample, criter symbols sy	0.8183 samples_leaf kind_sel: all 0.8263 sterion: gini ors: 74, name NDER, type 0.8262 sion: entropy simators: 112 DER, thresh- 0.8161
Neighboun TPE {classifier 5, min_s; n_neighboun TPE {classifier max_featu RF, rando EditedNea TPE {classifier max_featu name: RF old_cleani TPE {classifier {classifier } }	ors: 18, schoodCle 39 : {criter.amples_s ors: 18, schools 59 : {boots tres: sqrt, m_state: trestNeig 79 : {boots f, randor ng: 0.45 90 : {boots }	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nan mo_grp: UNI RF strap: False, min_samples 59}, sub: {ki hbours}} RF trap: False, ce, min_samp _state: 79}, 62349522895 RF	DER, threshold_cleaning: (EditedNearest Neighbours	Under resampling es: sqrt, min.; 39}, sub: {I Veighbours} Under resampling subsample, crit: 9, n_estimate 15, smo_grp: Under resampling baample, criter; split: 4, n_est smo_grp: UNICleaningRule} Under resampling subsample, criter; split: 4, n_est smo_grp: UNICleaningRule} Under resampling subsample, critersubsample, critersubsa	0.8183 samples_leaf kind_sel: all 0.8263 iterion: gini prs: 74, name NDER, type 0.8262 ion: entropy imators: 112 DER, thresh-} 0.8161
Neighboun TPE {classifier 5, min_si n_neighboun TPE {classifier max_featu RF, rando EditedNea TPE {classifier max_featu name: RF old_cleani TPE {classifier max_featu name: RF old_cleani TPE {classifier max_featu name: RF old_cleani	ors: 18, schoodCle 39 : {criter: amples_s rs: 18, s 59 : {boots: res: sqrt, m_state: restNeig 79 : {boots: rs: Nor r, randor ng: 0.45 90 : {boots: goods goo	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nan mo_grp: UNI RF strap: False, min_samples 59}, sub: {ki hbours} RF trap: False, one, min_samples 62349522895 RF strap: False, anin_samples 62349522895 RF	DER, threshold_cleaning: (EditedNearest Neighbours Ax_depth: 10, max_featurme: DTC, random_state: DER, type: EditedNearest! EditedNearest Neighbours Class_weight: balanced_s leaf: 5, min_samples_splind_sel: all, n_neighbors: Neighbourhood CleaningRule Cleass_weight: balanced_subs_leaf: 17, min_samples sub: {n_neighbors: 5, 284, type: Neighbourhood RandomUnderSampler class_weight: balanced_les_leaf: 3, min_samples	Under resampling es: sqrt, min; 39}, sub: {I Neighbours}} Under resampling subsample, crit: 9, n_estimate 15, smo_grp: U Under resampling baample, criter resampling to the criter split: 4, n_est smo_grp: UNI ICleaningRule} Under resampling subsample, criter split: 4, n_est smo_grp: UNI ICleaningRule} Under resampling subsample, cr	0.8183 samples_leaf kind_sel: all 0.8263 iterion: gini brs: 74, name NDER, type 0.8262 DER, thresh 0.8161 iterion: gini mators: 112
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Neighboun TPE {classifier 5, min_si n_neighbo TPE {classifier max_featu RF, rando EditedNea TPE {classifier max_featu name: RF old_cleani TPE {classifier max_featu name: RF UNDER, TPE {classifier featu name: RF UNDER, TPE {classifier	ors: 18, schoodCle 39 : {criter: amples_s rs: 18, schools: {boots rres: sqrt, m_state: rrestNeig r79 : {boots rres: Noor sqrt, randor ng: 0.45 90 : {boots rres: log: {boots rres: log: {boots rres: log: {boots rres: log: {boots res: log: {boots	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nan mo_grp: UNI RF strap: False, min_samples 59}, sub: {ki hbours}} trap: False, can mo_state: 79}, 62349522895 RF strap: False, can mo_state: 90}, ndomUnderS: RF rap: False, cla	EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest EditedNearest EditedNearest EditedNearest EditedNearest Seighbours class_weight: balanced_s leaf: 5, min_samples_spl ind_sel: all, n_neighbors: Neighbourhood CleaningRule class_weight: balanced_subs_leaf: 17, min_samples sub: {n_neighbors: 5, 284, type: Neighbourhood RandomUnderSampler class_weight: balanced_les_leaf: 3, min_samples sub: {random_state: 90, rampler}} Neighbourhood CleaningRule ass_weight: balanced_cleales_leaf: 3, min_samples sub: {random_state: 90, rampler}}	Under resampling es: sqrt, ming 39}, sub: {I Veighbours}} Under resampling subsample, crit: 9, n_estimato 15, smo_grp: U Under resampling basample, criter resampling basample, criter syntimato Location of the content	0.8183 samples_leaf kind_sel: all 0.8263 iterion: gini prs: 74, name NDER, type 0.8262 ion: entropy imators: 112 DER, thresh 0.8161 iterion: gini mators: 121 ue, smo_grp 0.8236
Neighboun TPE {classifier 5, min_si n_neighboun TPE {classifier max_featu RF, rando EditedNea TPE {classifier max_featu name: RF old_cleani TPE {classifier max_featu name: RF UNDER, TPE {classifier quay_featu name: RF UNDER, TPE {classifier quay_featu name: RF UNDER, TPE {classifier quay_featu name: RF UNDER, TPE	sors: 18, schoodCle 39 : {criter: amples_s rs: 18, schools sors: 18, schools res: sqrt, m_state: screstNeig 79 : {boots res: Nor r, randon ng: 0.45 90 : {boots res: log r, randon type: Ra 109 : {boots rs: log r, randon type: Ra 109 : {boots rs: log r, randon type: Ra 109 : {boots rs: log r, randon type: Ra 109 : {boots rs: log r, randon type: Ra 109 : {boots rs: log r, randon type: Ra 109	smo_grp: UN: aningRule}} DT ion: gini, ma plit: 12, nai mo_grp: UNI RF strap: False, min_samples 59), sub: {ki hbours}} RF trap: False, o ne, min_sample 62349522895 RF strap: False, o ne, min_sample 62349522895 RF strap: False, o ne, min_sample 62349522895 RF strap: False, o ndomUnderSi RF rap: False, cl:leaf: 1, min	DER, threshold_cleaning: 0 EditedNearest Neighbours ax_depth: 10, max_featur me: DTC, random_state: DER, type: EditedNearest EditedNearest Neighbours class_weight: balanced_s leaf: 5, min_samples_spl ind_sel: all, n_neighbors: Neighbourhood CleaningRule class_weight: balanced_su les_leaf: 17, min_samples sub: {n_neighbors: 5, 284, type: Neighbourhood RandomUnderSampler class_weight: balanced_les_leaf: 3, min_samples sub: {random_state: 90, rampler}} Neighbourhood CleaningRule	Under resampling es: sqrt, min_ 39}, sub: {I Veighbours}} Under resampling subsample, cri it: 9, n_estimate 15, smo_grp: U Under resampling baample, criter resampling bample, criter split: 4, n_est smo_grp: UNI CleaningRule} Under resampling cubsample, criter subsample, criter subsample, criter resampling subsample, criter resampling	0.8183 samples_leaf cind_sel: all 0.8263 iterion: gini ors: 74, name NDER, type 0.8262 ion: entropy ion: en

TABLE S-29 "VOWELO" – CONTINUED FROM PREVIOUS COLUMN

TABLE S-29 "VOWEL0"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	DT	Instance	Under	0.9424
			HardnessThreshold	resampling	
Grid	18	DT	Instance	Under	0.9659
Cit	27	IZNIN	HardnessThreshold	resampling	0.0202
Grid	27	KNN	RandomUnderSampler	Under	0.9303
Grid	29	SVM	D 1 I I - 1 C 1	resampling	0.0214
Gna	29	SVIVI	RandomUnderSampler	Under	0.9314
Grid	36	RF	CondensedNearest	resampling Under	0.9268
Giid	30	Kr			0.9208
Grid	39	DT	Neighbour Instance	resampling Under	0.9572
Giiu	39	DI	HardnessThreshold	resampling	0.9372
Grid	59	DT	Instance	Under	0.9659
Giid		D1	HardnessThreshold	resampling	0.7037
Grid	79	RF	CondensedNearest	Under	0.945
Onu	19	KI	Neighbour	resampling	0.943
Grid	90	DT	Instance	Under	0.9314
Onu	90	DI	HardnessThreshold	resampling	0.9314
Grid	109	RF	CondensedNearest	Under	0.9308
Onu	109	KI	Neighbour	resampling	0.9308
Random	9	DT	RepeatedEdited	Under	0.9592
randoni	´	101	NearestNeighbours	resampling	0.9392
Lelaccifier	· [critori	on: gini may	_depth: 6, max_features:		ples leaf: 10
			TC, random_state: 9}, sub:		
			epeatedEditedNearestNeigh		ii_licigiloois.
Random	18	RF	RandomUnderSampler	Under	0.9405
Kanuom	10	KI.	Kandomondersampler		0.9403
Laloccifian	. (bootet	tron: Truo ale	l ass_weight: balanced, crite	resampling	nov footures:
			n_samples_split: 6, n_esti		
Random	27	DT	ClusterCentroids	Under resampling	0.9607
Lelaccifier	· Coritori	on: gini may	_depth: 11, max_features:		nnles leaf: 6
			TC, random_state: 27}, su		
			grp: UNDER, type: Cluste		
Random	29	RF	ClusterCentroids	Under	0.9453
Kandom	29	KI	ClusterCentrolus	resampling	0.9433
1classifier	· Shoots	tran: False (class_weight: balanced, cr		nav features:
			min_samples_split: 19, n		
			ator: MiniBatchKMeans,		
			s, voting: hard}}	random_state.	2), smo_grp.
Random	36	RF	NearMiss	Under	0.9469
Kanuom	30	KI.	inealiviiss	1	0.9409
[alossifiar	' (boote	tron: True o	lass_weight: None, criter	resampling	nov footures:
			_samples_split: 11, n_estir		
			_samples_spiit: 11, ii_estii ors: 7, ii_neighbors_ver3:		
			ors. /, n_nergnoors_vers:	ro, smo_grp: U	TIDEK, type:
NearMiss,			Neighbourhood	Under	0.9633
Dond	20				0.9633
Random	39	DT			0.7055
			CleaningRule	resampling	
{classifier	: {criteri	on: entropy, r	CleaningRule nax_depth: 9, max_feature	resampling es: None, min_	samples_leaf:
{classifier 7, min_sa	criteri mples_s	on: entropy, r plit: 17, nam	CleaningRule max_depth: 9, max_feature ie: DTC, random_state: 3	resampling es: None, min_s 9}, sub: {n_ne	samples_leaf: eighbors: 18,
{classifier 7, min_sa smo_grp:	criteri mples_s UNDER	on: entropy, r plit: 17, nam	CleaningRule nax_depth: 9, max_feature	resampling es: None, min_s 9}, sub: {n_ne	samples_leaf: eighbors: 18,
{classifier 7, min_sa smo_grp: CleaningF	criteri cmples_s UNDER Cule}}	on: entropy, r plit: 17, nam R, threshold_c	CleaningRule max_depth: 9, max_feature ne: DTC, random_state: 3 cleaning: 0.7375389907289	resampling es: None, min_ 9}, sub: {n_n 9757, type: Ne	samples_leaf: eighbors: 18, ighbourhood-
{classifier 7, min_sa smo_grp:	criteri mples_s UNDER	on: entropy, r plit: 17, nam	CleaningRule nax_depth: 9, max_feature ne: DTC, random_state: 3 cleaning: 0.7375389907289 RepeatedEdited	resampling es: None, min_ 9}, sub: {n_ne 9757, type: Ne	samples_leaf: eighbors: 18,
{classifier 7, min_sa smo_grp: CleaningF Random	criteri amples_s UNDER Rule}}	on: entropy, r plit: 17, nam k, threshold_c	CleaningRule nax_depth: 9, max_feature nax_depth: 9, max_feature nax_depth: 9, max_feature nax_depth: 0.7375389907289 RepeatedEdited NearestNeighbours	resampling es: None, min_ 9}, sub: {n_n 9757, type: Ne Under resampling	samples_leaf: eighbors: 18, ighbourhood-
{classifier 7, min_sa smo_grp: CleaningF Random {classifier	: {criteri imples_s UNDER Rule}} 59	on: entropy, r plit: 17, nam R, threshold_c DT ion: gini, ma	CleaningRule max_depth: 9, max_feature e: DTC, random_state: 3 leaning: 0.7375389907289 RepeatedEdited NearestNeighbours x_depth: 12, max_feature	resampling es: None, min_ 9}, sub: {n_n 0757, type: Ne Under resampling s: None, min_	samples_leaf: eighbors: 18, ighbourhood- 0.9575 samples_leaf:
{classifier 7, min_sa smo_grp: CleaningR Random {classifier 10, min_sa	:: {criteri imples_s UNDER Rule}} 59 :: {criteri samples_	on: entropy, r plit: 17, nam R, threshold_c DT ion: gini, ma split: 18, na	CleaningRule max_depth: 9, max_feature ee: DTC, random_state: 3 leaning: 0.7375389907289 RepeatedEdited NearestNeighbours x_depth: 12, max_feature ume: DTC, random_state:	resampling es: None, min_ 9}, sub: {n_n 757, type: Ne Under resampling s: None, min_ 59}, sub: {1	samples_leaf: eighbors: 18, ighbourhood- 0.9575 samples_leaf: kind_sel: all,
{classifier 7, min_sa smo_grp: CleaningE Random {classifier 10, min_sn_neighbor	:: {criteri imples_s UNDER Rule}} 59 :: {criteri samples_	on: entropy, r plit: 17, nam R, threshold_c DT ion: gini, ma split: 18, na	CleaningRule max_depth: 9, max_feature e: DTC, random_state: 3 leaning: 0.7375389907289 RepeatedEdited NearestNeighbours x_depth: 12, max_feature	resampling es: None, min_ 9}, sub: {n_n 757, type: Ne Under resampling s: None, min_ 59}, sub: {1	samples_leaf: eighbors: 18, ighbourhood- 0.9575 samples_leaf: kind_sel: all,
{classifier 7, min_sa smo_grp: CleaningR Random {classifier 10, min_sa smo_grp: classifier 10	:: {criteri imples_s UNDER Rule}} 59 :: {criteri samples_	on: entropy, r plit: 17, nam R, threshold_c DT ion: gini, ma split: 18, na	CleaningRule max_depth: 9, max_feature ee: DTC, random_state: 3 leaning: 0.7375389907289 RepeatedEdited NearestNeighbours x_depth: 12, max_feature ume: DTC, random_state:	resampling es: None, min_ 9}, sub: {n_n 757, type: Ne Under resampling s: None, min_ 59}, sub: {1	samples_leaf: eighbors: 18, ighbourhood- 0.9575 samples_leaf: kind_sel: all,
{classifier 7, min_sa smo_grp: Cleaning Random {classifier 10, min_n_neighbo	:: {criteri nmples_s UNDER Rule}} 59 :: {criteri samples_ ors: 14, s	on: entropy, r plit: 17, nam k, threshold_c DT ion: gini, ma split: 18, na smo_grp: UNI	CleaningRule max_depth: 9, max_feature ne: DTC, random_state: 3 leaning: 0.7375389907289 RepeatedEdited NearestNeighbours x_depth: 12, max_feature ume: DTC, random_state: DER, type: RepeatedEdited	resampling es: None, min_ 9}, sub: {n_n 9757, type: Ne Under resampling s: None, min_ 59}, sub: {l 1NearestNeight	samples_leaf: eighbors: 18, ighbourhood- 0.9575 samples_leaf: kind_sel: all, bours}}
{classifier 7, min_sa smo_grp: CleaningR Random {classifier 10, min_n_neighbor Random	: {criteri amples_s UNDER Rule}} 59 : {criteri samples_ ors: 14, s	on: entropy, r plit: 17, nam c, threshold_c DT ion: gini, ma _split: 18, na mo_grp: UNI DT	CleaningRule max_depth: 9, max_feature ne: DTC, random_state: 3 leaning: 0.7375389907289 RepeatedEdited NearestNeighbours x_depth: 12, max_feature ume: DTC, random_state: DER, type: RepeatedEdited	resampling ss: None, min_ 9}, sub: {n_n 0757, type: Ne Under resampling s: None, min_ 59}, sub: {l 1NearestNeight Under resampling	samples_leaf: eighbors: 18, ighbourhood- 0.9575 samples_leaf: kind_sel: all, ours}} 0.9293
{classifier 7, min_sa smo_grp: CleaningR Random {classifier 10, min_in_neighbor Random {classifier	: {criteriumples_s UNDER Rule}} 59 : {criterisamples_ ors: 14, s	on: entropy, 1 plit: 17, nam c, threshold_c DT ion: gini, ma split: 18, na mo_grp: UNI DT ion: gini, ma	CleaningRule max_depth: 9, max_feature nax_depth: 9, max_feature nax_depth: 10 max_feature nax_depth: 10 max_feature nearestNeighbours nax_feature nearestNeighbours nea	resampling ss: None, min_ 9}, sub: {n_n 0757, type: Ne Under resampling s: None, min_ 59}, sub: {l ther ther ther ther ther ther ther ther	samples_leaf: eighbors: 18, ighbourhood- 0.9575 samples_leaf: kind_sel: all, bours}} 0.9293 samples_leaf:
{classifier 7, min_sa smo_grp: Cleaningk Random {classifier 10, min_sn_neighbor Random {classifier 2, min_sa	: {criteriumples_s UNDER tule}} 59 59 : {criterismples_s samples_srs: 14, s 79 : {criterismples_s 50 }	on: entropy, r plit: 17, nam k, threshold_c DT ion: gini, ma split: 18, na mo_grp: UNI DT ion: gini, ma plit: 8, name	CleaningRule max_depth: 9, max_feature e: DTC, random_state: 3 leaning: 0.7375389907289 RepeatedEdited NearestNeighbours x_depth: 12, max_feature une: DTC, random_state: DER, type: RepeatedEdited NearMiss x_depth: 15, max_feature	resampling ss: None, min_ 9}, sub: {n_n 0757, type: Ne Under resampling s: None, min_ 59}, sub: {l NearestNeight Under resampling s: None, min_ 9}, sub: {n_n n n n n n n n n n n n n n n n n n n	samples_leaf: eighbors: 18, ighbourhood- 0.9575 samples_leaf: kind_sel: all, bours}} 0.9293 samples_leaf:

continued	on	the	next	column

Method			ITINUED FROM PREVIO		
	Seed	Classifier	Resampler	Res.Group	GM
Random	90	DT	RepeatedEdited	Under	0.947
(1 :0	ļ ,	<u> </u>	NearestNeighbours	resampling	
			nax_depth: 3, max_feature		
			me: DTC, random_state: DER, type: RepeatedEdited		
Random	109	DT	Neighbourhood	Under	0.9333
Kandoni	109	D1	CleaningRule	resampling	0.9333
{classifier	: {criteri	on: entropy r	nax_depth: 10, max_featur		samples leaf
			e: DTC, random_state: 10		
smo_grp:	UNDEF		leaning: 0.456882210712		
CleaningF					
TPE	9	RF	SVMSMOTE	Over	0.9595
(1 'C	(1 ,			resampling	
			class_weight: balanced_	1 /	
			<pre>bles_leaf: 13, min_sample sub: {k_neighbors: 4,</pre>		
			state: 9, smo_grp: OVER,		
TPE	18	SVM	Instance	Under	0.9593
	10	0.111	HardnessThreshold	resampling	0.,,,,
{classifier	: {C: 198	8.3262342994	6415, coef0: 0.0639265297		ee: 3, gamma:
			98215354, kernel: poly, na		
			se, tol: 0.02019496347860		
			mo_grp: UNDER, type: Ir		
TPE	27	DT	Neighbourhood	Under	0.9633
(alaa-if	 		CleaningRule	resampling	aamamla - 1C
			nax_depth: 19, max_featur		
			e: DTC, random_state: 2		
silio_grp. CleaningF		t, ilifesiloiu_t	leaning: 0.4714043233145	5441, type. Ne	igiibouiiioou-
TPE	29	DT	Neighbourhood	Under	0.9662
			CleaningRule	resampling	0.7002
{classifier	: {criteri	ion: entropy, r	nax_depth: 3, max_feature		samples leaf:
			e: DTC, random_state: 2		
smo_grp:	UNDER	threshold_c	leaning: 0.4379946403039	6684, type: Ne	ighbourhood-
CleaningF	<pre>{ule}}</pre>				
TPE	36	RF	ClusterCentroids	Under	0.9595
	L		<u> </u>	resampling	
			class_weight: balanced, cr		
			nin_samples_split: 10, n_ ator: MiniBatchKMeans,		
			s, voting: hard}}	random_state.	50, smo_grp.
TPE	39	RF	RandomUnderSampler	Under	0.9473
11.2	37	l Tu	randomendersampler	resampling	0.7175
{classifier	: {boots	strap: True, o	class_weight: balanced_su		ion: entropy,
			oles_leaf: 2, min_samples		
name: RF	, randon	n_state: 39},	sub: {random_state: 39, re	enlacement: Fal	
	type: Ra	1 TT 1 C		F	lse, smo_grp:
UNDER,	type. rea	andomUnderS.	ampler}}	r	
	59	SVM	Instance	Under	lse, smo_grp: 0.9451
TPE	59	SVM	Instance HardnessThreshold	Under resampling	0.9451
TPE {classifier	59 :: {C:	SVM 124.60103887	Instance HardnessThreshold 700755, coef0: -0.12721	Under resampling 527626419113	0.9451 , degree: 2,
TPE {classifier gamma: a	59 :: {C: uto, gam	SVM 124.60103887 ma_value: 3.3	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel:	Under resampling 527626419113 rbf, name: SVM	0.9451 , degree: 2, 1 , probability:
TPE {classifier gamma: a True, rand	59 :: {C: uto, gam dom_stat	SVM 124.60103887 ma_value: 3.3 te: 59, shrink	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319	Under resampling .527626419113 rbf, name: SVM 94380104923},	0.9451 , degree: 2, 1, probability: sub: {cv: 8,
TPE {classifier gamma: at True, rand estimator:	59 :: {C: uto, gam dom_stat gradient	SVM 124.60103887 ma_value: 3.3 te: 59, shrink	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel:	Under resampling .527626419113 rbf, name: SVM 94380104923},	0.9451 , degree: 2, 1, probability: sub: {cv: 8,
TPE {classifier gamma: a True, rand estimator: nessThres	59 : {C: uto, gam dom_stat gradient hold}}	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 dom_state: 59, smo_grp: U	Under resampling 527626419113 rbf, name: SVN 94380104923}, JNDER, type: I	0.9451 , degree: 2, 1, probability: sub: {cv: 8, instanceHard-
TPE {classifier gamma: a True, rand estimator: nessThres	59 :: {C: uto, gam dom_stat gradient	SVM 124.60103887 ma_value: 3.3 te: 59, shrink	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 ddom_state: 59, smo_grp: U	Under resampling 527626419113 rbf, name: SVN 94380104923}, JNDER, type: I	0.9451 , degree: 2, 1, probability: sub: {cv: 8,
TPE {classifier gamma: artrue, randestimator: nessThresTPE	59 : {C: uto, gam dom_stat gradient hold}}	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 dom_state: 59, smo_grp: U	Under resampling 527626419113 rbf, name: SVD 94380104923}, JNDER, type: I Under resampling	0.9451 , degree: 2, 1, probability: sub: {cv: 8, instanceHard-
TPE {classifier gamma: ai True, rand estimator: nessThres TPE {classifier	59 C: {C: uto, gam dom_stat gradient hold}} 79 : {criter	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule	Under resampling 527626419113 rbf, name: SVM 94380104923}, JNDER, type: I Under resampling s: None, min_	0.9451 , degree: 2, f., probability: sub: {cv: 8, instanceHard- 0.9711 samples_leaf:
TPE {classifier gamma: ar True, rand estimator: nessThres TPE {classifier 8, min_sa	59 ": {C: uto, gam dom_stat gradient hold}} 79 ": {criter amples_s	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma split: 10, nam	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: Uneighbourhood CleaningRule x_depth: 18, max_feature	Under resampling 5527626419113 rbf, name: SVM 94380104923 }, JNDER, type: I Under resampling s: None, min_19 }, sub: {n_n}	0.9451 , degree: 2, I, probability: sub: {cv: 8, instanceHard- 0.9711 samples_leaf: eighbors: 12,
TPE {classifier gamma: ar True, rand estimator: nessThres TPE {classifier 8, min_sa	: {C: uto, gam dom_stat gradient hold}} 79 :: {criter amples_s UNDEF	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma split: 10, nam R, threshold_c	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 ileaning: 0.657327261386	Under resampling 5527626419113 rbf, name: SVM 94380104923 }, JNDER, type: I Under resampling s: None, min_19 }, sub: {n_n}	0.9451 , degree: 2, 1, probability: sub: {cv: 8, instanceHard-0.9711
TPE {classifier gamma: ar True, rand estimator: nessThres TPE {classifier 8, min_sa smo_grp:	: {C: uto, gam dom_stat gradient hold}} 79 :: {criter amples_s UNDEF	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma split: 10, nam	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel::ing: False, tol: 0.0981319 idom_state: 59, smo_grp: Uneighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7	Under resampling 527626419113 rbf, name: SVM 94380104923}, JNDER, type: I Under resampling s: None, min_9}, sub: {n_n}2768, type: Ne	0.9451 , degree: 2, I, probability: sub: {cv: 8, instanceHard- 0.9711 samples_leaf: eighbors: 12,
TPE {classifier gamma: ar True, rance estimator: nessThres TPE {classifier 8, min_sa smo_grp: CleaningF TPE	59 59 c C c c c c c c c c	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma split: 10, nam R, threshold_c	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 ileaning: 0.6573272613863	Under resampling 527626419113 rbf, name: SVM 94380104923}, JNDER, type: I Under resampling s: None, min_ 19}, sub: {n_n} 2768, type: Ne Over resampling	0.9451 , degree: 2, f., probability: sub: {cv: 8, instanceHard-0.9711} samples_leaf: eighbors: 12, ighbourhood-0.9513
TPE {classifier gamma: at True, rann estimator: nessThres TPE {classifier 8, min_sa smo_grp: CleaningF TPE {classifier	59 C: (C: uto, gam dom_stat gradient hold} 79 C: (criter amples_s UNDER Rule} 90 C: (algorithm of the content of t	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma split: 10, nam R, threshold_c KNN ithm: brute, n	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 cleaning: 0.6573272613862 SMOTENC _neighbors: 23, name: Kl	Under resampling 527626419113 rbf, name: SVN 4380104923], JNDER, type: I Under resampling 199, sub: {n_n} 2768, type: Ne Over resampling NN, p: 1, rande	0.9451 , degree: 2, 1, probability: sub: {cv: 8, instanceHard-o.9711 samples_leaf: eighbors: 12, 12 12 12 12 12 12 12 12 12 12 12 12 12
TPE {classifier gamma: au True, ranc estimator: nessThres TPE {classifier 8, min_sa smo_grp: CleaningF TPE {classifier weights: 6	59 C: (C: uto, gam dom_stat gradient hold) 79 79	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma pplit: 10, nam R, threshold_c KNN ithm: brute, n , sub: {category	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 cleaning: 0.6573272613862 SMOTENCneighbors: 23, name: K1 rical_features: True, k_nei	Under resampling 527626419113 rbf, name: SVN 4380104923], JNDER, type: I Under resampling 199, sub: {n_n} 2768, type: Ne Over resampling NN, p: 1, rande	0.9451 , degree: 2, 1, probability: sub: {cv: 8, instanceHard-o.9711 samples_leaf: eighbors: 12, ighbourhood-o.9513 om_state: 90,
TPE {classifier gamma: a True, rane estimator: nessThres TPE {classifier 8, min_sa smo_grp: Cleaning TPE {classifier weights: c smo_grp:	59 C: {C: Uto, gam dom_stat gradient hold}	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma pplit: 10, nam R, threshold_c KNN ithm: brute, n , sub: (catego type: SMOTE	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 ideaning: 0.6573272613862 SMOTENC _neighbors: 23, name: KI prical_features: True, k_neightors: True, k_neigh	Under resampling 527626419113 rbf, name: SVM 94380104923}, JNDER, type: I Under resampling s: None, min_19}, sub: {n_n}2768, type: Ne Over resampling ryN, p: 1, randoghbors: 9, rand	0.9451 , degree: 2, 1, probability: sub: {cv: 8, nstanceHard- 0.9711 samples_leaf: eighbors: 12, ighbourhood- 0.9513 om_state: 90, om_state: 90,
TPE {classifier gamma: au True, ranc estimator: nessThres TPE {classifier 8, min_sa smo_grp: CleaningF TPE {classifier weights: 6	59 C: (C: uto, gam dom_stat gradient hold) 79 79	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma pplit: 10, nam R, threshold_c KNN ithm: brute, n , sub: {category	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 cleaning: 0.6573272613866 SMOTENCneighbors: 23, name: Kl prical_features: True, k_nei INC} Neighbourhood	Under resampling 527626419113 rbf, name: SVM 94380104923}, JNDER, type: I Under resampling s: None, min_ 9}, sub: {n_n} 2768, type: Ne Over resampling NN, p: 1, rande ghbors: 9, rand Under	0.9451 , degree: 2, 1, probability: sub: {cv: 8, instanceHard-o.9711 samples_leaf: eighbors: 12, 12 12 12 12 12 12 12 12 12 12 12 12 12
TPE {classifier gamma: at True, rane estimator: nessThres TPE {classifier 8, min_sa smo_grp: CleaningF TPE {classifier weights: d smo_grp: TPE	59 59 59 59 59 59 59 59	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma split: 10, nam k, threshold_c KNN ithm: brute, n , sub: {catego type: SMOTE RF	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 ileaning: 0.6573272613863 SMOTENC _neighbors: 23, name: KI rical_features: True, k_neighourhood CleaningRule Neighbourhood CleaningRule	Under resampling 527626419113 rbf, name: SVM 94380104923}, JNDER, type: I Under resampling s: None, min_ 19}, sub: {n_n 2768, type: Ne Over resampling NN, p: 1, randighbors: 9, rand Under resampling Under resampling	0.9451 , degree: 2, I, probability: sub: {cv: 8, instanceHard-0.9711} samples_leaf: eighbors: 12, ighbourhood-0.9513 om_state: 90, om_state: 90, 0.9584
TPE {classifier gamma: at True, rand estimator: nessThres TPE {classifier 8, min_sa smo_grp: CleaningF TPE {classifier weights: d smo_grp: TPE {classifier yeights: d smo_grp: TPE {classifier	59 59 150	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma split: 10, nam R, threshold_c KNN ithm: brute, n , sub: {catego type: SMOTE RF strap: False, o	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 cleaning: 0.6573272613862 SMOTENCneighbors: 23, name: KI rical_features: True, k_neighCS} Neighbourhood CleaningRule class_weight: balanced_su	Under resampling 527626419113 rbf, name: SVN 94380104923}, JNDER, type: I Under resampling s: None, min_ 9}, sub: {n_n} 2768, type: Ne Over resampling NN, p: 1, rand- ghbors: 9, rand Under resampling bsample, criter	0.9451 , degree: 2, 1, probability: sub: {cv: 8, instanceHard- 0.9711 samples_leaf: eighbors: 12, ighbourhood- 0.9513 om_state: 90, om_state:
TPE {classifier gamma: ar True, rane estimator: nessThres TPE {classifier 8, min_sa smo_grp: Cleanings TPE {classifier weights: 6 smo_grp: TPE {classifier max_featu	: {C: uto, gam dom_stat gradient hold}} 79 : {criter amples_s UNDEF Rule}} 90 : {algori listance} OVER, 109 : {boots ures: Noi	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma pplit: 10, nam R, threshold_c KNN ithm: brute, n , sub: (catego type: SMOTE RF strap: False, o ne, min_samp	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 ideaning: 0.657327261386 SMOTENC _neighbors: 23, name: KI rrical_features: True, k_nei iNC} Neighbourhood CleaningRule class_weight: balanced_su les_leaf: 12, min_samples_	Under resampling 527626419113 rbf, name: SVN 94380104923}, JNDER, type: 1 Under resampling s: None, min_ 19}, sub: {n_n} 2768, type: Ne Over resampling NN, p: 1, rande ghbors: 9, rand Under resampling bsample, criter split: 11, n_est	0.9451 , degree: 2, 1, probability: sub: {cv: 8, nstanceHard- 0.9711 samples_leaf: eighbors: 12, ighbourhood- 0.9513 om_state: 90, om_state: 90, om_state: 90, instance 138, instance 138, instance 138, instance 20,
TPE {classifier gamma: ar True, rane estimator: nessThres TPE {classifier 8, min_sa smo_grp: CleaningF TPE {classifier smo_grp: TPE {classifier asmo_grp: TPE {classifier smo_grp: TPE {classifier smo_grp: TPE {classifier smo_grp: TPE {classifier smo_grp: TPE {classifier sma_featt name: RF	: {C: uto, gam dom_stat gradient hold} 79 : {criter amples_s UNDER Rule} 90 : {algori listance} OVER, 109 : {boots res: Nor	SVM 124.60103887 ma_value: 3.3 te: 59, shrink t-boosting, rar DT ion: gini, ma plit: 10, nam R, threshold_c KNN ithm: brute, n , sub: {categor type: SMOTE RF strap: False, one, min_samp m_state: 109}	Instance HardnessThreshold 700755, coef0: -0.12721 27241326663295, kernel: ing: False, tol: 0.0981319 idom_state: 59, smo_grp: U Neighbourhood CleaningRule x_depth: 18, max_feature ie: DTC, random_state: 7 cleaning: 0.6573272613862 SMOTENCneighbors: 23, name: KI rical_features: True, k_neighCS} Neighbourhood CleaningRule class_weight: balanced_su	Under resampling 527626419113 rbf, name: SVM 94380104923}, JNDER, type: I Under resampling s: None, min_ 19}, sub: {n_n} 2768, type: Ne Over resampling NN, p: 1, rande ghbors: 9, rand Under resampling bsample, criter split: 11, n_est smo_grp: UN	0.9451 , degree: 2, 1, probability: sub: {cv: 8, nstanceHard- 0.9711 samples_leaf: eighbors: 12, ighbourhood- 0.9513 om_state: 90, om_state: 90, inators: 138, DER, thresh-

TABLE S-30 "GLASS-0-1-6_vs_2" – CONTINUED FROM PREVIOUS COLUMN

"GLASS-0-1-6_VS_2" Classifier GM Method Seed Resampler Res.Group Grid KNN ADASYN Over 0.7882 resampling Grid 18 LR RandomOverSampler 0.8004 Over resampling Grid 27 LR RandomOverSampler 0.7919 Over resampling 29 LR SMOTE 0.7854 Grid Over resampling Grid 36 LR RandomOverSampler 0.8064 Over resampling Grid 39 LR SMOTE Over 0.7844 resampling Grid 59 LR RandomOverSampler Over 0.7856 resampling SVM Grid 79 RandomOverSampler 0.7876 Over resampling 90 KNN SMOTE 0.7856 Grid Over resampling LR 0.7883 109 RandomOverSampler Grid Over resampling Random LR RandomOverSampler 0.8143 Over resampling 75.48177436495227, 11_ratio: 0.8068432565926712, name: LR, {classifier: {C: penalty_solver: 12+saga, random_state: 9, tol: 0.009595549865841447}, sub: {random_state: 9, smo_grp: OVER, type: RandomOverSampler}} SMOTE Random LR Over resampling {classifier: {C: 84.18871429455189, 11_ratio: 0.031394375239668135, name: LR, penalty_solver: none+newton-cg, random_state: 18, tol: 0.02153169993600245}, sub: $\{k_neighbors:\ 2,\ random_state:\ 18,\ smo_grp:\ OVER,\ type:\ SMOTE\}\}$ ADASYN LR Random Over penalty_solver: 12+newton-cg, random_state: 27, tol: 0.04156905140848651}, sub: {n_neighbors: 1, random_state: 27, smo_grp: OVER, type: ADASYN}} Random 29 SVM ClusterCentroids Under resampling {classifier: {C: 140.55061716068317, coef0: 0.9836581443011898, degree: 4, gamma: scale, gamma_value: 4.618089099543733, kernel: linear, name: SVM, probability: False, random_state: 29, shrinking: False, tol: 0.06230275347653504}, sub: {estimator: MiniBatchKMeans, random_state: 29, smo_grp: UNDER, type: ClusterCentroids, voting: soft}} LR RandomOverSampler 0.812 Random 36 Over penalty_solver: none+lbfgs, random_state: 36, tol: 0.04931194444057016}, sub: {random_state: 36, smo_grp: OVER, type: RandomOverSampler}} Random | 39 | LR | SMOTETomek | Co 0.8341 Random Combine penalty_solver: 12+lbfgs, random_state: 39, tol: 0.08098649952226862}, sub: {random_state: 39, smo_grp: COMBINE, type: SMOTETomek}} 59 0.8202 Random LR ADASYN Over {n_neighbors: 8, random_state: 59, smo_grp: OVER, type: ADASYN}} Random LR RandomUnderSampler Under 0.8442

penalty_solver: 12+lbfgs, random_state: 79, tol: 0.0255985821097188}, sub: {random_state: 79, replacement: True, smo_grp: UNDER, type: RandomUnderSampler}}

TABLE S-30

continued on the next column

pler}}

GL	A33-U-1	1-0_v3_2	- CONTINUED FROM P	KEVIOUS COI	ZUMIN
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	SVM	ClusterCentroids	Under	0.8254
{classifier	 	 5 9974283839	 90506, coef0: 0.979850937	resampling	e. 2. gamma.
			6936881, kernel: poly, nar		
			lse, tol: 0.08016742589955		
	eans, ran	ndom_state: 9	00, smo_grp: UNDER, typ	e: ClusterCent	roids, voting:
soft}}	1.00		L A D A GYDY		0.0222
Random	109	LR	ADASYN	Over resampling	0.8233
{classifier	: {C: :	1 38.045673463	884948, 11_ratio: 0.6364		name: LR.
			andom_state: 109, tol: (
n_neight	ors: 7, r		109, smo_grp: OVER, typ	e: ADASYN}]	
TPE	9	SVM	SMOTETomek	Combine	0.855
Lelassifier	 - JC+ 121	 6092224522	 2427, coef0: -0.3492238041	resampling	e. 2 gamma:
			701781763, kernel: linear		
			king: False, tol: 0.05151		
dom_state	: 9, smo	_grp: COMB	INE, type: SMOTETomek	}}	•
TPE	18	SVM	CondensedNearest	Under	0.884
(1 :0	(C. 10	0060525222	Neighbour	resampling	
			5417, coef0: 0.649305026 0783808728, kernel: line		
			shrinking: False, tol: 0.		
			12, random_state: 18, sm		
densedNe					
TPE	27	SVM	CondensedNearest	Under	0.843
(1 :0	(0.1	11401202052	Neighbour 50 0 24004	resampling	
			2501614, coef0: -0.24006		
			0.7265082544596413, ke: 27, shrinking: False, to		
			SS: 38, random_state: 27		
		Neighbour}}		,8	, .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
TPE	29	SVM	SMOTEENN	Combine	0.8333
	L			resampling	
			42874, coef0: 0.75825181		
			66719938382, kernel: poly king: False, tol: 0.046125		
			BINE, type: SMOTEENN		,, 540. (1411
TPE	36	SVM	ClusterCentroids	Under	0.8745
	L			resampling	
			7016, coef0: 0.813657966		
			01619353, kernel: poly, na True, tol: 0.00412324279		
			o_grp: UNDER, type: Clu		
TPE	39	LR	SMOTETomek	Combine	0.8341
				resampling	
			27503, 11_ratio: 0.7679		
			andom_state: 39, tol: 0.0		57528}, sub:
		, smo_grp: C	OMBINE, type: SMOTET ADASYN		0.8309
TPE	59	LK	ADASTN	Over resampling	0.8309
{classifier	: {C: 7	9.805536514	55683, 11_ratio: 0.14372		name: LR.
penalty_so	olver: 11	+liblinear, ra	andom_state: 59, tol: 0.	0447825891085	
{n_neight	ors: 3, r	andom_state:	59, smo_grp: OVER, type	: ADASYN}}	-
TPE	79	LR	RandomUnderSampler	Under	0.8478
(alaa-if	(C:	00 00050746	020204 11 (resampling	mama: IB
			029294, 11_ratio: 0.4608 om_state: 79, tol: 0.05055		
			ue, smo_grp: UNDER, typ		
TPE	90	SVM	SMOTEENN	Combine	0.8577
				resampling	
			19193, coef0: 0.268249653	8054604, degre	
			29567763, kernel: poly, na		
			rue, tol: 0.0833682868888	80986}, sub: {1	andom_state:
90, smo_g TPE	grp: CON 109	IBINE, type:	SMOTEENN}} RandomUnderSampler	Under	0.8372
IFL	109	LK	KandomonderSampler	resampling	0.8372
{classifier	: {C: 9	9.5696470245	33175, 11_ratio: 0.2417		name: LR,
			ndom_state: 109, tol: 0.0		

{random_state: 109, replacement: False, smo_grp: UNDER, type: RandomUnderSam-

TABLE S-31 "GLASS2"

TABLE S-31 "GLASS2" – CONTINUED FROM PREVIOUS COLUMN

Grid 18 LR RandomOverSampler Over csampling resampling Probability of the probability of	Centroids Under resampling 0.84 1_ratio: 0.37873734089916067, name: L
Grid 18	_ratio: 0.37873734089916067, name: L
Grid 27 LR SMOTETomek Combine resampling Grid 29 LR BorderlineSMOTE Over resampling Combine resampling Over resamp	
Grid 27 LR SMOTETomek Combine resampling	e: 90 tol: 0.0002433598336614427U g
Grid 29 LR BorderlineSMOTE Over 0.7916 Random 109 LR ADAS	smo_grp. errb2rt, typer enastereemrer
resampling	N Over 0.80
	resampling
	ratio: 0.25105685844700537, name: L
	te: 109, tol: 0.04533175511624368}, st
Grid 39 LR BorderlineSMOTE Over 0.7894 {n_neighbors: 3, random_state: 109, smo	
	neSMOTE Over 0.85
Grid 59 LR BorderlineSMOTE Over 0.7864	resampling 1_ratio: 0.639150853236825, name: L
	tate: 9, tol: 0.08392244027122764}, su
	ghbors: 6, random state: 9, smo grp: OVE
Grid 90 LR SMOTENC Over 0.7892 type: BorderlineSMOTE}}	3
resampling TPE 18 LR Border	neSMOTE Over 0.85
Grid 109 LR BorderlineSMOTE Over 0.7826	resampling
	11_ratio: 0.87726134816207, name: L
penarty_solver. 11+nonnear, random_st	te: 18, tol: 0.02851628829682766}, si
	_neighbors: 5, random_state: 18, smo_g
local min samples local 1 min samples splits 2 m satimatoms 22 mans DE non	Y 1 C 1 Y 1
dom_state: 9}, sub: {n_neighbors: 46, n_seeds_S: 37, random_state: 9, smo_grp: TPE 27 SVM Random_state: 9}	UnderSampler Under 0.84
VINTER C. 1. DV AV. (1.))	resampling resam
CHASSING. (C. 15.72221)003027250, CO	3, kernel: linear, name: SVM, probabili
	e, tol: 0.01235561911589197}, sub: {ra
{classifier: {C: 42.92819973163165, 11_ratio: 0.5979968038254196, name: LR, dom state: 27, replacement: False, smo	rp: UNDER, type: RandomUnderSampler
penalty_solver: 11+liblinear, random_state: 18, tol: 0.0478182881550911}, sub: TPE 29 LR Cluster	Centroids Under 0.85
{k_neighbors: 3, m_neighbors: 3, out_step: 0.46523861666119337, random_state: 18,	resampling
smo_grp: OVER, type: SVMSMOTE}} {classifier: {C: 15.424146910183218,	I_ratio: 0.11218912253516353, name: L
	state: 29, tol: 0.009080800366741495}, su
	smo_grp: UNDER, type: ClusterCentroi
manulty solver electional sage random state, 27 tel, 0.002006565708061128) sub-	CMOTE
{k_neighbors: 2, kind: borderline-2, m_neighbors: 4, random_state: 27, smo_grp: TPE 36 LR Border	neSMOTE Over 0.85
OVER (P. 1.1; GMOTE))	resampling I_ratio: 0.7017111292185436, name: L
	te: 36, tol: 0.08499942919183098}, su
Neighbour resampling {k neighbors: 8, kind: borderline-2, m	neighbors: 7, random_state: 36, smo_g
{classifier: {C: 125.54913814416983, coef0: 0.9299709885731351, degree: 2, gamma: OVER, type: BorderlineSMOTE}}	- 2 ,
auto, gamma_value: 4.872502000709642, kernel: linear, name: SVM, probabil-	neSMOTE Over 0.85
ity: False, random_state: 29, shrinking: False, tol: 0.056220245726125995}, sub:	resampling
	1_ratio: 0.5072092427069871, name: L
P. 1. 1. GMOTE O	: 39, tol: 0.0002918457129169015}, si
resampling OVER, type: BorderlineSMOTE}	_neighbors: 7, random_state: 39, smo_g
(1 :C (C 10 500012400405441 11 :: 0 4200200000112001 I.B.)	neSMOTE Over 0.85
penalty_solver: none+lbfgs, random_state: 36, tol: 0.021097155620384556}, sub:	resampling
{k_neighbors: 9, kind: borderline-2, m_neighbors: 4, random_state: 36, smo_grp: {classifier: {C: 21.780042800710312.}	1 ratio: 0.5815858368143092, name: L
OVER, type: BorderlineSMOTE}} penalty solver: 12+newton-cg, random	tate: 59, tol: 0.08231807564048196}, su
Random 39 LR ClusterCentroids Under 0.8142 {k_neighbors: 6, kind: borderline-2, rr	_neighbors: 5, random_state: 59, smo_g
resampling OVER type: BorderlineSMOTE}}	
{classifier: {C: 0.1363956892011328, 11_ratio: 0.11048266253786253, name: LR, rankly calver panelly calver pane	Tomek Combine 0.83
penalty_solver: none+lbfgs, random_state: 39, tol: 0.09886429210100482}, sub: {estimator: KMeans, random_state: 39, smo_grp: UNDER, type: ClusterCentroids, voting: {classifier: {C: 186.0775333200581, coef	resampling
(classifier, (c. 160.077555200501, coch	0: -0.06577466706501278, degree: 2, gamn
27 auto, gamma_varue. 4.30337437247)03	, kernel: linear, name: SVM, probabili
resampling dom_state: 79, sinfinking: Fa	se, tol: 0.05733727052001181}, sub: {ra
(-1	neSMOTE Over 0.85
penalty_solver: 12+lbfgs, random_state: 59, tol: 0.08676794164291679}, sub:	resampling 0.83
{k_neighbors: 8, kind: borderline-2, m_neighbors: 9, random_state: 59, smo_grp: {classifier: {C: 77.08446227074595,	1_ratio: 0.9138153975543295, name: L
OVER, type: BorderlineSMOTE}}	te: 90, tol: 0.06662272119270829}, su
Random 79 SVM CondensedNearest Under 0.8358 {k_neighbors: 7, kind: borderline-2, rr	_neighbors: 5, random_state: 90, smo_g
Neighbour resampling OVER, type: BorderlineSMOTE}}	, ,
{classifier: {C: 100.74844366989657, coef0: -0.42117710498134464, degree: 2, TPE 109 LR Border	neSMOTE Over 0.85
gamma: scale, gamma_value: 6.791626003158912, kernel: linear, name: SVM, probability: True_random_state: 70_shrinking: False_tal: 0.013067102760301761_sub:	resampling
	1_ratio: 0.9489030411359061, name: L
penarty_solver. iz+newton-eg, faindoin_s	ate: 109, tol: 0.01130089342065971}, st
(K_ineignoots, 4, kind. borderinie-z, in	neighbors: 6, random_state: 109, smo_g
continued on the next column OVER, type: BorderlineSMOTE}}	

TABLE S-32 "SHUTTLE-CO-VS-C4"

0 : 1	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	RF	No	No	1.0
			resampling	resampling	
Grid	18	RF	No	No	1.0
0.11	27	DE.	resampling	resampling	1.0
Grid	27	RF	No 1:	No	1.0
Grid	29	RF	resampling	resampling	1.0
Gna	29	KF	No	No	1.0
Calif	26	RF	resampling	resampling	1.0
Grid	36	KF	No	No managementing	1.0
Grid	39	RF	resampling No	resampling No	1.0
Onu	39	KI.	resampling	resampling	1.0
Grid	59	RF	No	No	1.0
Ond		Ki	resampling	resampling	1.0
Grid	79	RF	No	No	1.0
Ona	' '	I CI	resampling	resampling	1.0
Grid	90	RF	No	No	1.0
			resampling	resampling	
Grid	109	RF	No	No	1.0
Ona	107	144	resampling	resampling	1.0
Random	9	RF	ClusterCentroids	Under	1.0
	_			resampling	
{classifier	: {boots	trap: True, c	class_weight: None, c		v. max features:
			n_samples_split: 13, n		
			: KMeans, random_sta		
		voting: hard}			
Random	18	DT	EditedNearest	Under	1.0
	10	2.	Neighbours	resampling	1.0
{classifier	: {criteri	on: entropy, i	max_depth: 5, max_fea		nin samples leaf:
			me: DTC, random_st		
			ER, type: EditedNeare		
Random	27	RF	BorderlineSMOTE	Over	1.0
Random	2'	Ki	DorderiniesWOTE	resampling	1.0
(1 'C					l
	· {boots	tran: True o	·lass weight: balanced	i subsample c	riterion: entrony
			class_weight: balanced		
max_featu	res: sqr	t, min_sampl	es_leaf: 7, min_sampl	es_split: 17, n	_estimators: 126,
max_featu name: RF,	res: sqr random	t, min_sample a_state: 27}, s	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l	es_split: 17, n kind: borderline	_estimators: 126,
max_featu name: RF, 7, random	res: sqr random _state: 2	t, min_sample n_state: 27}, s 27, smo_grp:	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir	es_split: 17, n kind: borderline neSMOTE}}	_estimators: 126, -1, m_neighbors:
max_featu name: RF,	res: sqr random	t, min_sample a_state: 27}, s	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l	es_split: 17, n kind: borderline neSMOTE}} Combine	_estimators: 126, -1, m_neighbors:
max_featu name: RF, 7, random Random	res: sqrt random _state: 2	t, min_sample n_state: 27}, s 27, smo_grp:	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlin SMOTETomek	es_split: 17, n kind: borderline neSMOTE}} Combine resampling	_estimators: 126, -1, m_neighbors:
max_featu name: RF, 7, random Random {classifier	res: sqri random _state: 2 29	t, min_sample n_state: 27}, s 27, smo_grp: DT ion: gini, ma	es_leaf: 7, min_sampl sub: {k_neighbors: 4, I OVER, type: Borderlin SMOTETomek ax_depth: 10, max_fer	es_split: 17, n kind: borderline neSMOTE}} Combine resampling atures: 1, min_	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7,
max_featu name: RF, 7, random Random {classifier min_samp	res: sqrt random _state: 2 29 : {criter les_split	t, min_sample state: 27}, s 27, smo_grp: DT ion: gini, ma : 15, name:	es_leaf: 7, min_sampl sub: {k_neighbors: 4, I OVER, type: Borderlir SMOTETomek ux_depth: 10, max_fe; DTC, random_state:	es_split: 17, n kind: borderline neSMOTE}} Combine resampling atures: 1, min_	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp:	res: sqrt random _state: 2 29 : {criter les_split COMBI	t, min_samplon_state: 27}, s 7, smo_grp: DT ion: gini, ma: 15, name: NE, type: SM	es_leaf: 7, min_sampl sub: {k_neighbors: 4, I OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek}}	es_split: 17, n, cind: borderline neSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29,
max_featu name: RF, 7, random Random {classifier min_samp	res: sqrt random _state: 2 29 : {criter les_split	t, min_sample state: 27}, s 27, smo_grp: DT ion: gini, ma : 15, name:	es_leaf: 7, min_sampl sub: {k_neighbors: 4, I OVER, type: Borderlir SMOTETomek ux_depth: 10, max_fe; DTC, random_state:	es_split: 17, n, cind: borderline eSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra}	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random	random _state: 2 29 : {criter combi	t, min_samplo _state: 27}, s 27, smo_grp: b DT ion: gini, ma : 15, name: NE, type: SM DT	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fer DTC, random_state: IOTETomek}} SMOTE	es_split: 17, n, cind: borderline eSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra}	_estimators: 126, -1, m_neighbors: 1.0 samples_leaf: 7, andom_state: 29,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier	random _state: 29 : {criter les_split COMBI 36 : {criter	t, min_samplo n_state: 27}, s 17, smo_grp: DT ion: gini, ma : 15, name: NE, type: SM DT	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE sMOTE ax_depth: 16, max_fe:	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling tatures: sqrt, n	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s	res: sqri random _state: 2 29 : {criter les_split COMBI 36 : {criter samples_	t, min_sample_state: 27}, s 17, smo_grp: DT ion: gini, ma : 15, name: NE, type: SM DT ion: gini, m. split: 7, nan	es_leaf: 7, min_sampl sub: {k_neighbors: 4, } OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ax_depth: 16,	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling tatures: sqrt, n	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st	res: sqri random _state: 2 29 : {criter les_split COMBI 36 : {criter samples_ tate: 36,	t, min_sample_state: 27}, s 17, smo_grp: DT ion: gini, ma 15, name: NE, type: SM DT ion: gini, ma split: 7, nan smo_grp: OV	es_leaf: 7, min_sampl sub: {k_neighbors: 4, 1} OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek}} SMOTE ax_depth: 16, max_fe: ax_depth: 16, max_fe: brc, random_sta	es_split: 17, n, cind: borderline eSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling aturers: sqrt, n ate: 36}, sub:	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 nin_samples_leaf: {k_neighbors: 3,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s	res: sqri random _state: 2 29 : {criter les_split COMBI 36 : {criter samples_	t, min_sample_state: 27}, s 17, smo_grp: DT ion: gini, ma : 15, name: NE, type: SM DT ion: gini, m. split: 7, nan	es_leaf: 7, min_sampl sub: {k_neighbors: 4, } OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ax_depth: 16,	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random	res: sqri random _state: 2 29 : {criter eles_split COMBI 36 : {criter samples_ tate: 36,	t, min_sample_state: 27}, s 17, smo_grp: DT ion: gini, ma: : 15, name: NE, type: SM DT ion: gini, ma: split: 7, nan smo_grp: OV RF	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fer DTC, random_state: IOTETomek}} SMOTE ax_depth: 16, max_fer ax_depth: 16, max_fer ax_depth: 16, max_fer corrections are subjected by the subje	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling eatures: sqrt, n te: 36}, sub: Over resampling eatures: sqrt, n te: 36}, sub:	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: {k_neighbors: 3, 1.0
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier	random_state: 29 : {criter les_split COMBI 36 : {criter samples_tate: 36, 39 : {boots}	t, min_sample_state: 27}, s 17, smo_grp: DT ion: gini, ma : 15, name: NE, type: SM DT ion: gini, ma split: 7, nan smo_grp: OV RF	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ax_depth: 16, max_fe: ptc, random_state: IOTETOMER SMOTE ax_depth: 16, max_fe: brown state: IOTETOMER SMOTE ax_depth: 16, max_fe: brown state: IOTETOMER SMOTE ax_depth: 16, max_fe: brown state: IOTETOMER SMOTE SMOTE class_weight: balanced	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling resampling tatures: sqrt, n te: 36}, sub: Over resampling resampling tatures: sqrt, n te: 36}, sub:	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 lin_samples_leaf: {k_neighbors: 3, 1.0 riterion: entropy,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier max_featu	random_state: 29 : {criter les_split COMBL 36} : {criter samples_tate: 36, 39} : {boots res: 1, m	t, min_sample_state: 27}, s 7, smo_grp: DT ion: gini, ma : 15, name: NE, type: SM DT ion: gini, ma split: 7, nan smo_grp: OV RF trap: True, c iin_samples_l	es_leaf: 7, min_sampl sub: {k_neighbors: 4, } OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ne: DTC, random_sta VER, type: SMOTE} SMOTE class_weight: balancedeaf: 2, min_samples_sp	es_split: 17, n, cind: borderline eSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atureres: sqrt, n te: 36}, sub: Over resampling subsample, coplit: 15, n_estim	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 nin_samples_leaf: {k_neighbors: 3, 1.0 riterion: entropy, ators: 126, name:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier fl, min_s random_st Random {classifier max_featu RF, random	res: sqri random_state: 2 29 : {criter les_split COMBI 36 : {criter samples_ tate: 36, 39 : {boots tres: 1, nr m_state:	t, min_sample_state: 27}, s 7, smo_grp: DT ion: gini, ma : 15, name: NE, type: SM DT ion: gini, ma split: 7, nan smo_grp: OV RF trap: True, c iin_samples_l	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ax_depth: 16, max_fe: ptc, random_state: IOTETOMER SMOTE ax_depth: 16, max_fe: brown state: IOTETOMER SMOTE ax_depth: 16, max_fe: brown state: IOTETOMER SMOTE ax_depth: 16, max_fe: brown state: IOTETOMER SMOTE SMOTE class_weight: balanced	es_split: 17, n, cind: borderline eSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atureres: sqrt, n te: 36}, sub: Over resampling subsample, coplit: 15, n_estim	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 nin_samples_leaf: {k_neighbors: 3, 1.0 riterion: entropy, ators: 126, name:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier andom_st Random {classifier st Random {classifier st Random st Random {classifier st Random	res: sqri random_state: 2 29 : {criter les_split COMBI 36 : {criter samples_ tate: 36, 39 : {boots res: 1, m_state:	t, min_sample_state: 27}, s 17, smo_grp: DT ion: gini, ma: 15, name: NE, type: SM DT ion: gini, ma: split: 7, nan smo_grp: OV RF trap: True, c in_samples_1 39}, sub: {k_	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ne: DTC, random_sta /ER, type: SMOTE} SMOTE class_weight: balanced eaf: 2, min_samples_si_ neighbors: 4, random_	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling ratures: sqrt, n te: 36}, sub: Over resampling _subsample, c cplit: 15, n_esting state: 39, smo_ state: 39, smo_	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: {k_neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier fle, min_s random_st Random {classifier dclassifier max_featu RF, random	res: sqri random_state: 2 29 : {criter les_split COMBI 36 : {criter samples_ tate: 36, 39 : {boots tres: 1, nr m_state:	t, min_sample_state: 27}, s 7, smo_grp: DT ion: gini, ma : 15, name: NE, type: SM DT ion: gini, ma split: 7, nan smo_grp: OV RF trap: True, c iin_samples_l	es_leaf: 7, min_sampl sub: {k_neighbors: 4, } OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ne: DTC, random_sta VER, type: SMOTE} SMOTE class_weight: balancedeaf: 2, min_samples_sp	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling eatures: sqrt, n te: 36}, sub: Over resampling l_subsample, c plit: 15, n_estim state: 39, smo_	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 nin_samples_leaf: {k_neighbors: 3, 1.0 riterion: entropy, ators: 126, name:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier max_featu RF, randon SMOTE}}	res: sqri random _state: 2 29 : {criter cles_split COMBI 36 : {criter samples_ aate: 36, 39 : {boots res: 1, m m_state:	t, min_sample_state: 27}, s 17, smo_grp: DT ion: gini, ma 15, name: NE, type: SM DT ion: gini, ma split: 7, nan smo_grp: OV RF trap: True, c nin_samples_1 39}, sub: {k_	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ax_depth: 16, max_fe: ptc, random_state: IOTETOMER ax_depth: 16, max_fe: ax_de	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling l_subsample, colit: 15, n_estim state: 39, smo_ Over resampling	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 in_samples_leaf: {k_neighbors: 3, 1.0 riterion: entropy, ators: 126, name: grp: OVER, type:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier fl6, min_s random_st Random {classifier max_featu RF, random SMOTE}} Random {classifier	res: sqri random _state: 2 29 : {criter les_split COMBI 36 : {criter samples_ sate: 36, 39 : {boots res: 1, m _state:	t, min_sample_state: 27}, s 17, smo_grp: 0 DT ion: gini, ma: 15, name: NE, type: SM DT ion: gini, ms ssplit: 7, nan smo_grp: OV RF trap: True, c in_samples 1 39}, sub: {k_	es_leaf: 7, min_sampl sub: {k_neighbors: 4, 1} OVER, type: Borderlin SMOTETomek nx_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: DTC, random_state: IOTETomek} SMOTE class_weight: balancec eaf: 2, min_samples_st neighbors: 4, random_ SMOTENC class_weight: balancec class_weight: balancec	es_split: 17, n, cind: borderline neSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling l_subsample, colit: 15, n_estim state: 39, smo_ Over resampling l_subsample, colit: 15, n_estim state: 39, smo_ Over resampling l_subsample, colit: 15, n_estim state: 39, smo_ Over resampling l_subsample, colit: 15, n_estim state: 39, smo_	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _iin_samples_leaf: {k_neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type: 1.0 _ii, max_features:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier dclassifier Random {classifier Random {classifier None, mi	res: sqri, random_state: 2 29 : {criter les_split COMBI 36 : {criter samples_cate: 36, 39 : {boots m_state: 36 : {toots m_state: 36 : {boots m_state: 36 : {boots m_state: 36 : {boots m_samples_cate:	t, min_sample_state: 27}, s 17, smo_grp: 0 17	es_leaf: 7, min_sampl sub: {k_neighbors: 4, 1} OVER, type: Borderlin SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: DTC, random_state: IOTECTOMER ax_depth: 16, max_fe: ne: DTC, random_state: SMOTE class_weight: balanced: at a min_samples_sq. neighbors: 4, random_ SMOTENC class_weight: balanced: class_weight: balanced: at a min_samples_sq. class_weight: balanced: smoTENC class_weight: balanced: at a min_samples_sq. smoTENC	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling _subsample, c polit: 15, n_estimations: sqrt,	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: {k_neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type: 1.0 _in_max_features: 149, name: RF,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier amax_featu RA, random SMOTE}} Random {classifier max_featu RA, random smo_smo_smo_smo_smo_smo_smo_smo_smo_smo_	res: sqri, random _state: 2 29 : {criter les_split COMBI 36 : {critersamples_rate: 36, 39 : {boots res: 1, n m_state: 59 : {boots n_samplate: 59}	t, min_sample_state: 27}, s 17, smo_grp: v 17, smo_grp: v 17, smo_grp: v 17, smo_grp: v 18, smo_grp: v 19, smo_grp: v 19, smo_grp: ov 19, smo_	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fer DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fer ax_depth: 16,	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling _subsample, c polit: 15, n_estimations: sqrt,	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: {k_neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type: 1.0 _in_max_features: 149, name: RF,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier max_featu RF, random SMOTE}} Random {classifier max_featu smo_grp: Random smo_grp: Random smo_grp: Random smo_grp: Random smo_grp: Random smo_grp:	res: sqri random _state: 2 29 : {criter les_split COMBI 36 : {criter samples_ tate: 36, 39 : {boots res: 1, n m_state: 59 : {boots particles of the state: 59 Comparison of the state: 50 Comparison o	t, min_sample_state: 27}, s 17, smo_grp: DT ion: gini, ma: : 15, name: NE, type: SM DT ion: gini, ma: split: 7, nan smo_grp: Ov RF trap: True, C iin_samples_1 39}, sub: {k_ RF trap: False, C ese_leaf: 16, , sub: {categotype: SMOTE	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fer DTC, random_state: IOTETomek}} SMOTE ax_depth: 16, max_fer ex_depth: 16,	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling resampling atures: sqrt, n te: 36}, sub: Over resampling l_subsample, colit: 15, n_estim state: 39, smo_ Over resampling l_ resampling state: 39, smo_ over resampling l_ criterion: gir n_estimators:neighbors: 7, 1	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: 1, andom_state: 29, 1.0 _in_samples_leaf: 1, andom_state: 10, and not
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier max_featu RR, random }{classifier max_featu RR, random {classifier max_featu RR, random }{classifier max_featu RR, random	res: sqri, random _state: 2 29 : {criter les_split COMBI 36 : {critersamples_rate: 36, 39 : {boots res: 1, n m_state: 59 : {boots n_samplate: 59}	t, min_sample_state: 27}, s 17, smo_grp: v 17, smo_grp: v 17, smo_grp: v 17, smo_grp: v 18, smo_grp: v 19, smo_grp: v 19, smo_grp: ov 19, smo_	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fer DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fer ax_depth: 16,	es_split: 17, n, cind: borderline esMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling l_subsample, c obit: 15, n_estim state: 39, smo_ Over resampling l, criterion: gin_estimators: _neighbors: 7, 1 Under	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: {k_neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type: 1.0 _in_max_features: 149, name: RF,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier fl, min_s random_st Random {classifier max_featu RF, random SMOTE}} Random {classifier max_featu RF, random smo_grp: Random {classifier None, mi random_st smo_grp: Random	res: sqri random _state: 2 29 : {criter les_split COMBL 36 : {criter samples_ tate: 36, 39 : {boots rmsstate: 59 : {boots rmssamples_ tate: 59} OVER,	t, min_sample_state: 27}, s 17, smo_grp: 0 17, smo_grp: 0 17, smo_grp: 0 18, same: 15, name: 15, name: 15, name: 15, name: 15 19 10 10 10 11 11 11 11 11 11 11 11 11 11	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek}} SMOTE ax_depth: 16, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: pe: DTC, random_state: IOTETomek} SMOTE sweight: balanced eaf: 2, min_samples_sp. neighbors: 4, random_ SMOTENC class_weight: balanced min_samples_split: 5, orical_features: True, k. SNC} Neighbourhood CleaningRule	es_split: 17, n, cind: borderline neSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling _subsample, cilit: 15, n_estim state: 39, smo_ Over resampling d, criterion: gin_estimators:_neighbors: 7, 1 Under resampling	_estimators: 126, -1, m_neighbors: 1.0 samples_leaf: 7, andom_state: 29, 1.0 iin_samples_leaf: {k_neighbors: 3, 1.0 riterion: entropy, ators: 126, name: grp: OVER, type: 1.0 ii, max_features: 149, name: RF, andom_state: 59,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier fl, min_s random_st Random {classifier max_featu RF, random SMOTE}} Random {classifier max_featu RF, random smo_grp: Random {classifier None, mi random_st smo_grp: Random	res: sqri random _state: 2 29 : {criter les_split COMBL 36 : {criter samples_ tate: 36, 39 : {boots rmsstate: 59 : {boots rmssamples_ tate: 59} OVER,	t, min_sample_state: 27}, s 17, smo_grp: 0 17, smo_grp: 0 17, smo_grp: 0 18, same: 15, name: 15, name: 15, name: 15, name: 15 19 10 10 10 11 11 11 11 11 11 11 11 11 11	es_leaf: 7, min_sampl sub: {k_neighbors: 4, 1} OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: brown state: IOTETomek} SMOTE ax_depth: 16, max_fe: brown state: IOTETomek} SMOTE class_weight: balanceceaf: 2, min_samples_state; Ineighbors: 4, random_ SMOTENC class_weight: balancecemin_samples_split: 5, orical_features: True, k. SNOTS Neighbourhood	es_split: 17, n, cind: borderline neSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling _subsample, cilit: 15, n_estim state: 39, smo_ Over resampling d, criterion: gin_estimators:_neighbors: 7, 1 Under resampling	_estimators: 126, -1, m_neighbors: 1.0 samples_leaf: 7, andom_state: 29, 1.0 iin_samples_leaf: {k_neighbors: 3, 1.0 riterion: entropy, ators: 126, name: grp: OVER, type: 1.0 ii, max_features: 149, name: RF, andom_state: 59,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier nax_featu RF, random {classifier None, mi random_st smo_grp: Random {classifier None, mi random_st smo_grp: Random {classifier None, mi random_st smo_grp: Random {classifier	res: sqri, random_state: 2 29 : {criter les_split COMBI 36 : {criter samples_cate: 36, 39 : {boots m_state: 59} OVER, 79 : {C: 61.	t, min_sample_state: 27}, s 17, smo_grp: v 17, smo_grp: v 17, smo_grp: v 18, smo_grp: v 19, smo_grp: v 19, smo_grp: v 10, smo: smo_gri, ma. 10, split: 7, nan 11, smo_grp: Ov 12, smo_grp: Ov 13, split: 7, nan 13, smo_grp: Ov 14, smo_grp: ov 15, sub: smo_grp: ov 16, sub: smo_grp: smo_grp: ov 16, sub: smo_grp: ov 16, sub: smo_grp: smo_gr	es_leaf: 7, min_sampl sub: {k_neighbors: 4, l OVER, type: Borderlir SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek}} SMOTE ax_depth: 16, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: pe: DTC, random_state: IOTETomek} SMOTE sweight: balanced eaf: 2, min_samples_sp. neighbors: 4, random_ SMOTENC class_weight: balanced min_samples_split: 5, orical_features: True, k. SNC} Neighbourhood CleaningRule	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resamplingsubsample, c plit: 15, n_estimators: sqrt, state: 39, smo_ over resamplingsubsample, c plit: 15, n_estimators:neighbors: 7, 1 Under resamplingsubsample, c plit: 15, n_estimators:neighbors: 7, 1 Under resamplingsubsample, c plit: 16, n_estimators:neighbors: 7, 1	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: 4, _neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type: 1.0 _in_max_features: 149, name: RF, andom_state: 59, 1.0 _egree: 4, gamma:
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier 16, min_s random_st Random {classifier max_featu RA, random {classifier max_featu RA, random {classifier max_featu RA, random {classifier max_featu RA, random {classifier value, mi random_st smo_grp: Random {classifier value, gan	res: sqri, random _state: 2 29 : {criter les_split COMBL 36 : {criter samples_cate: 36, 39 : {boots res: 1, rm _state: 59} Complete the complete th	t, min_sample_state: 27}, s 17, smo_grp: 1 DT ion: gini, ma: 15, name: NE, type: SM DT ion: gini, ma: split: 7, nan smo_grp: OV RF trap: True, c nin_samples_1 39}, sub: {k_ RF trap: False, c es_leaf: 16, , sub: {categotype: SMOTE SVM 31815747033 ae: 3.3257894	es_leaf: 7, min_sampl sub: {k_neighbors: 4, 1} OVER, type: Borderlin SMOTETomek ax_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: ne: DTC, random_state: IOTETomek} SMOTE class_weight: balanced: eaf: 2, min_samples_si, neighbors: 4, random_ SMOTENC class_weight: balanced: min_samples_split: 5, orical_features: True, k SNC} Neighbourhood CleaningRule 3934, coef0: 0.3894924	es_split: 17, n, cind: borderline heSMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling retures: sqrt, n te: 36}, sub: Over resampling L_subsample, c plit: 15, n_estim state: 39, smo_ over resampling l, criterion: gin_n_estimators: _neighbors: 7, 1 Under resampling l6267747495, d, name: SVM,	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: 4k_neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type: 1.0 _ii, max_features: 149, name: RF, andom_state: 59, 1.0 _egree: 4, gamma: probability: True,
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier l6, min_s random_st Random {classifier max_featu RF, random {classifier max_featu RF, random {classifier smo_grp: Random {classifier value, gan random_st random_st smo_grp: Random {classifier smo_grp: Random }	res: sqri random _state: 2 29 : {criter eles_split COMBI 36 : {criter samples_ sate: 36, 39 : {boots res: 1, n m_state: 59 : {boots n_samples_ istate: 59} OVER, 79 : {C: 61. nma_valuate: 79,	t, min_samplo_state: 27}, st. t, min_samplo_state: 27}, st. t, smo_grp: don: gini, ma: 15, name: 15, name: 15, name: NE, type: SM DT ion: gini, ma: 15, name: NE, type: SM DT ion: gini, ma: 15, name: NE, type: SM RF trap: True, catin_samples_1 and 139}, sub: {k_ RF trap: False, category, sub: {category, sub:	es_leaf: 7, min_sampl sub: {k_neighbors: 4, 1} OVER, type: Borderlir SMOTETomek nx_depth: 10, max_fe: DTC, random_state: IOTETomek} SMOTE ax_depth: 16, max_fe: processes by the second of the seco	es_split: 17, n, cind: borderline esMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling l_subsample, c obit: 15, n_estim state: 39, smo_ Over resampling l_t criterion: gin_estimators: _neighbors: 7, 1 Under resampling l6267747495, dy, name: SVM, 0080868}, sub:	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: 3, [k_neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type: 1.0
max_featu name: RF, 7, random Random {classifier min_samp smo_grp: Random {classifier l6, min_s random_st Random {classifier max_featu RF, random {classifier max_featu RF, random {classifier smo_grp: Random {classifier value, gan random_st random_st smo_grp: Random {classifier smo_grp: Random }	res: sqri random state: 2 29 : {criter eles_split COMBL 36 : {critersamples_aate: 36, 39 : {boots res: 1, rrm_state: 59} OVER, 179 : {C: 61. ma_value: 79, UNDER	t, min_samplo_state: 27}, st. t, min_samplo_state: 27}, st. t, smo_grp: don: gini, ma: 15, name: 15, name: 15, name: NE, type: SM DT ion: gini, ma: 15, name: NE, type: SM DT ion: gini, ma: split: 7, nan smo_grp: OV RF trap: True, catin_samples_1 and samples_1	es_leaf: 7, min_sampl sub: {k_neighbors: 4, leaghbors: 4, leaghbors: 4, leaghbors: 4, leaghbors: 4, leaghbors: 10, max_ference: DTC, random_state: leaghbors: 16, max_ference: DTC, random_state: leaghbors: 16, max_ference: DTC, random_state: leass_weight: balancece leaf: 2, min_samples_sq.neighbors: 4, random_state: leass_weight: balancece leass_weight:	es_split: 17, n, cind: borderline esMOTE}} Combine resampling atures: 1, min_ 29}, sub: {ra} Over resampling atures: sqrt, n te: 36}, sub: Over resampling l_subsample, c obit: 15, n_estim state: 39, smo_ Over resampling l_t criterion: gin_estimators: _neighbors: 7, 1 Under resampling l6267747495, dy, name: SVM, 0080868}, sub:	_estimators: 126, -1, m_neighbors: 1.0 _samples_leaf: 7, andom_state: 29, 1.0 _in_samples_leaf: 3, [k_neighbors: 3, 1.0 _riterion: entropy, ators: 126, name: grp: OVER, type: 1.0

TABLE S-32 "SHUTTLE-C0-VS-C4" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	RepeatedEdited	Under	1.0
(1 .0	(1)		NearestNeighbours		
			class_weight: balanced		
			es_leaf: 18, min_samp , sub: {kind_sel: mo		
			, sub. {kilid_sel. lilo NearestNeighbours}}	de, ii_lieigiiboi	s. 15, sino_gip.
Random	109	RF	SMOTEENN	Combine	1.0
Rundom	10)	"	SMOTEEN	resampling	1.0
{classifier	: {boots	trap: True, o	class_weight: balanced		riterion: entropy,
			es_leaf: 14, min_sam		
name: RF,	random	_state: 109},	sub: {random_state:	109, smo_grp: (COMBINE, type:
SMOTEE	NN}}				
TPE	9	RF	ClusterCentroids	Under	1.0
(1 :0	(1		1 1 1 1	resampling	
			class_weight: None, c		
			n_samples_split: 13, n : KMeans, random_sta		
		voting: hard}		atc. 9, sino_grp	. UNDER, type.
TPE	18	DT	EditedNearest	Under	1.0
112	10	51	Neighbours	resampling	1.0
{classifier	{criteri	on: entropy, i	max_depth: 5, max_fe		in_samples_leaf:
14, min_s	samples_	split: 7, na	me: DTC, random_s	tate: 18}, sub:	{kind_sel: all,
n_neighbo	rs: 7, sn	no_grp: UND	ER, type: EditedNeare	estNeighbours}}	
TPE	27	RF	BorderlineSMOTE	Over	1.0
				resampling	
			class_weight: balanced		
			es_leaf: 7, min_sampl		
			sub: {k_neighbors: 4, l		-1, m_neignbors:
TPE	_state: 2	DT	OVER, type: Borderlin SMOTETomek	Combine	1.0
IFE	29	101	SWICTETOILER	resampling	1.0
{classifier	{criter	ion: gini. ma	nx_depth: 10, max_fe		samples leaf: 7.
			DTC, random_state:		
			IOTETomek}}	. ,, (
TPE	36	DT	SMOTE	Over	1.0
				resampling	
			ax_depth: 16, max_fe		
			ne: DTC, random_sta	ite: 36}, sub:	{k_neighbors: 3,
			ER, type: SMOTE}}	0	1.0
TPE	39	RF	SMOTE	Over resampling	1.0
{classifier	{boots	tran: True o	lass_weight: balanced		riterion: entropy
			eaf: 2, min_samples_s		
			neighbors: 4, random_		
SMOTE } }					31 , , , , , , , ,
TPE	59	RF	SMOTENC	Over	1.0
				resampling	
			class_weight: balanced		
			min_samples_split: 5,		
_			orical_features: True, k	_neighbors: 7, r	andom_state: 59,
		type: SMOTE			
TPE	79	SVM	Neighbourhood	Under	1.0
(-1: G	(C) (1	21015747022	CleaningRule	resampling	
			3934, coef0: 0.3894924 25123032, kernel: pol		
			ue, tol: 0.0471856794		
			leaning: 0.631182282		
CleaningR		i, unesnoid_c	Jeaning. 0.031102202	5701515, type.	reignoodinood
TPE	90	RF	RepeatedEdited	Under	1.0
11.2	70	"	NearestNeighbours	resampling	1.0
{classifier	{boots	trap: True, o	class_weight: balanced		riterion: entropy.
			es_leaf: 18, min_samp		
name: RF	, randoi	n_state: 90}	, sub: {kind_sel: mo		
			NearestNeighbours}}	-	_J 1
TPE	109	RF	SMOTEENN	Combine	1.0
				resampling	
			class_weight: balanced		
			es_leaf: 14, min_samp		
		_state: 109},	sub: {random_state: 1	109, smo_grp: (COMBINE, type:
SMOTEE	NIN } }				

TABLE S-33
"YEAST-1_VS_7"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	SVM	SMOTENC	Over	0.8092
~	10			resampling	
Grid	18	LR	Instance	Under	0.790
C.: 1	27	CVA	HardnessThreshold	resampling	0.01
Grid	27	SVM	SMOTENC	Over	0.81
C.: 1	20	DE	D - 1 - 1 C 1	resampling	0.000
Grid	29	RF	RandomUnderSampler	Under	0.8092
C : 1	26	7 D	T .	resampling	0.70
Grid	36	LR	Instance	Under	0.79:
Caid	20	CVA	HardnessThreshold	resampling	0.702
Grid	39	SVM	SMOTENC	Over	0.783
Grid	59	LR	SMOTENC	resampling	0.790:
OHU	39	LK	SIMOTENC	Over	0.790
Grid	79	LR	Instance	resampling Under	0.788
GHU	19	LK	HardnessThreshold		0.788
Grid	90	LR	Instance	resampling Under	0.785
GHu	20	LIX	HardnessThreshold		0.783
Grid	109	SVM	SMOTENC	resampling Over	0.813
GHu	109	2 A 1A1	SIVIOTEINC	resampling	0.013
Random	9	LR	ADASYN	Over	0.805
randoni	´	LIX	110/10/11	resampling	0.003
{classifier	· {C· 5	0 823288125	669247, 11_ratio: 0.19069		name IE
nenalty of	olver 1	.0.025200125 1±lihlinear	random_state: 9, tol: 0	112330070002,	54436}, sub
			9, smo_grp: OVER, type:		r -1 505, Sul
Random	18	RF	SMOTEENN	Combine	0.791
NanuOIII	10	KI.	SMOTEENN		0.791
Lolosoifica	· (boots	tran. Tena	class_weight: None, criter	resampling	nav footuss
			in_samples_split: 14, n_es		
			state: 18, smo_grp: COMI		
Random	27	LR	SMOTENC	Over	0.788
(1	L .~	(5.550 ()) · · ·	550500 11	resampling	L
	: {C:	03.77003444	578508, 11_ratio: 0.7891	126417.109934	name: LR
	. `				
		ne+newton-c	g, random_state: 27, tol: 0	0.039959228050	063832}, sub
{categoric	al_featu	ne+newton-c		0.039959228050	063832}, sub
{categoric SMOTEN	al_featu C}}	ne+newton-c res: True, k_1	g, random_state: 27, tol: 0 neighbors: 6, random_state	0.039959228050 :: 27, smo_grp:	063832}, sub OVER, type
{categoric	al_featu	ne+newton-c	g, random_state: 27, tol: 0 neighbors: 6, random_state	0.039959228050 :: 27, smo_grp:	063832}, sub OVER, type
{categoric SMOTEN Random	al_featur C}} 29	one+newton-c res: True, k_r	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold	0.039959228050 :: 27, smo_grp: Under resampling	063832}, sub OVER, type
{categoric SMOTEN Random {classifier:	al_featur C}} 29 : {C: 11.	svm svy	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661	0.039959228050 :: 27, smo_grp: Under resampling 12038533, degree	063832}, sub OVER, type 0.791 ee: 3, gamma
{categoric SMOTEN Random {classifier auto, gam	al_featur C}} 29 : {C: 11. ma_valu	svM SVM 88297693107	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea	0.039959228050 :: 27, smo_grp: Under resampling 12038533, degre r, name: SVM	OVER, type 0.791 ee: 3, gamma, probability
{categoric SMOTEN Random {classifier: auto, gam True, rand	al_featu C}} 29 : {C: 11. ma_valu lom_stat	svM 88297693107 e: 4.4366913 e: 29, shrinki	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525	0.039959228050 :: 27, smo_grp: Under resampling 12038533, degre r, name: SVM 59463377}, sub	063832}, sub OVER, type 0.791 ee: 3, gamma , probability : {cv: 7, esti
{categoric SMOTEN(Random {classifier: auto, gam True, rand mator: No	al_featur C}} 29 : {C: 11. ma_valu lom_stat ne, rando	svM 88297693107 ae: 4.4366913 e: 29, shrinki om_state: 29,	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I	Under resampling 12038533, degree r, name: SVM 59463377}, sub nstanceHardnes	0.791 0.791 ee: 3, gamma, probability: {cv: 7, est:sThreshold}
{categoric SMOTEN(Random {classifier: auto, gam True, rand mator: No	al_featu C}} 29 : {C: 11. ma_valu lom_stat	svM 88297693107 e: 4.4366913 e: 29, shrinki	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525	0.039959228050: 27, smo_grp: Under resampling 12038533, degree r, name: SVM 99463377}, sub nstanceHardnes Over	0.791 0.791 ee: 3, gamma, probability: {cv: 7, est:sThreshold}
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random	al_featur C}} 29 : {C: 11. ma_valu lom_stat ne, rando	svm SVM S88297693107 see: 4.4366912 ee: 29, shrinki om_state: 29,	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE	0.039959228050: 27, smo_grp: Under resampling 12038533, degre, r, name: SVM 59463377}, sub nstanceHardnes Over resampling	03832}, sub OVER, type 0.791 ee: 3, gamma , probability : {cv: 7, esti sThreshold} 0.795
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier	al_featur C}} 29 : {C: 11. ma_valu lom_stat ne, rande 36 : {C:	svm SVM 88297693107 e: 4.4366912 e: 29, shrinki om_state: 29, LR 33.96619927:	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 59463377}, subnstanceHardnes Over resampling 157146818768,	03832}, sub OVER, type 0.791 ee: 3, gamma ; probability : {cv: 7, est sThreshold} 0.795 name: LF
{categoric SMOTEN Random {classifier: auto, gam True, rand mator: No Random {classifier: penalty_sc	al_featur C}} 29 : {C: 11. uma_valu lom_stat ne, rande 36 : {C:	see+newton-c, res: True, k_1 SVM 88297693107 ee: 4.4366912 e: 29, shrinki om_state: 29, LR 33.96619927, 1+liblinear, r	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0.	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 59463377}, sub instanceHardnes Over resampling 157146818768, 0677576085770	0.791 Dee: 3, gamma, probability: {cv: 7, est sThreshold} 0.795 name: LF 08996}, sub
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb}	al_featurC} 29	sne+newton-c, res: True, k_1 SVM 88297693107 se: 4.436691; e: 29, shrinki om_state: 29, LR 33.96619927. +liblinear, rm_neighbors:	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 59463377}, sub instanceHardnes Over resampling 157146818768, 0677576085770	0.791 Dee: 3, gamma, probability: {cv: 7, est sThreshold} 0.795 name: LF 08996}, sub
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb}	al_featurC} 29	see+newton-c, res: True, k_1 SVM 88297693107 ee: 4.4366912 e: 29, shrinki om_state: 29, LR 33.96619927, 1+liblinear, r	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 59463377}, sub instanceHardnes Over resampling 157146818768, 0677576085770	0.791 Dee: 3, gamma, probability: {cv: 7, estis sThreshold} 0.795 name: LR 08996}, sub
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb}	al_featurC} 29	sne+newton-c, res: True, k_1 SVM 88297693107 se: 4.436691; e: 29, shrinki om_state: 29, LR 33.96619927. +liblinear, rm_neighbors:	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 59463377}, sub instanceHardnes Over resampling 157146818768, 0677576085770	Occupance of the control of the control occupance occupa
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random	al_featurC}} 29 : {C: 11.ma_valulom_stat ne, rando} 36 : {C: OVER, 39	sne+newton-c, res: True, k_1 SVM 88297693107 sie: 4.4366912 sie: 29, shrinki om_state: 29, LR 33.96619927; +Hiblinear, rm_neighbors: type: SVMSN SVM	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids	0.039959228050: 27, smo_grp: Under resampling 12038533, degre r, name: SVM 59463377}, sub instanceHardnes Over resampling 157146818768, 0677576085770 01930468, rande	0.791 0.791 0.791 0.791 0.791 0.795 0.795 0.795 0.795 0.795 0.795 0.795 0.795 0.779
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random	al_featurC}} 29 : {C: 11.ma_valulom_stat ne, rando} 36 : {C: OVER, 39	sne+newton-c, res: True, k_1 SVM 88297693107 sie: 4.4366912 sie: 29, shrinki om_state: 29, LR 33.96619927; +Hiblinear, rm_neighbors: type: SVMSN SVM	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE}}	0.039959228050: 27, smo_grp: Under resampling 12038533, degre r, name: SVM 59463377}, sub instanceHardnes Over resampling 157146818768, 0677576085770 01930468, rande	0.791 0.791 0.791 0.791 0.791 0.791 0.795 0.795 0.795 0.795 0.795 0.795 0.795 0.795 0.779
[categoric SMOTEN Random Classifier auto, gam True, rand mator: No Random Classifier penalty_sc {k_neighb smo_grp: Random Classifier Random Classifier Random Classifier Random Classifier Random Classifier Classifier Random Classifier Random Classifier Class	al_featur C}} 29 : {C: 11. uma_valu om_stat ne, rande 36 : {C: olver: 11 ors: 7, 1 oVER, 39 : {C: 11.	sne+newton-c, res: True, k_1 SVM 88297693107 se: 4.436691; e: 29, shrinki; om_state: 29, LR 33.96619927: 1+liblinear, r m_neighbors: type: SVMSN SVM .69547834356	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids	0.039959228050: 27, smo_grp: Under resampling 12038533, degre r, name: SVM 59463377}, sub instanceHardnes Over resampling 157146818768, 0677576085770 01930468, rando Under resampling 1100513, degree	O.791 OVER, type O.791 O.791 O.791 O.795 O.795 O.795 O.795 O.795 O.795 O.795 O.795 O.779 O.779 O.779 O.779
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifier scale, gan }	al_featur C}} 29 : {C: 11. ma_valu lom_stat ne, rande 36 : {C: olver: 11 oors: 7, 1 oVER, 39 : {C: 11. nma_valu	sne+newton-c, res: True, k_1 SVM 88297693107 se: 4,4366912 se: 29, shrinki om_state: 29, LR 33.96619927: 1+liblinear, rm_neighbors: type: SVMSN SVM 69547834356 se: 0.871722	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE}} ClusterCentroids 6305, coef0: 0.1955596992	0.039959228050: 27, smo_grp: Under resampling 12038533, degree r, name: SVM 95463377}, sub nstanceHardnes Over resampling 157146818768 0677576085770 01930468, rando Under resampling 1100513, degree ur, name: SVM	0.791 ee: 3, gamma, probability: {cv: 7, esti 0.795 name: LR 0.8996}, sub 0.779 ee: 2, gamma, probability probability
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifier scale, gan False, randem	al_featurC}} 29 : {C: 11. ma_valutom_stat ne, rande 36 : {C: over: 11 over: 7, 1 over, 39 : {C: 11. nma_valutom_stat dom_stat ne, rande 36 : {C:	sne+newton-c, res: True, k_1 SVM 88297693107 se: 29, shrinki e: 29, shrinki 133.96619927. 14-liblinear, rm neighbors: type: SVMSN SVM 69547834356 ue: 0.871722 te: 39, shrinki	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992	0.039959228050: 27, smo_grp: Under	O.791 ee: 3, gamma, probability: {cv: 7, estimate: LR 0.8996}, subcom_state: 36 0.779 ee: 2, gamma, probabilitysub: {estimate: 4, gamma, probabilitysub: 4, gamma, probabilitysub: {estimate: 4, gamma, probabilitysub: 4, gamma, probabi
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifier scale, gan False, random tor: MiniE	al_featur C}} 29 : {C: 11. ma_valu lom_stat ne, rande 36 : {C: over: 7, over: 7, over: 7, sover: 7, sover: 11 dom_stat atchKM	sne+newton-c, res: True, k_1 SVM 88297693107 se: 29, shrinki e: 29, shrinki 133.96619927. 14-liblinear, rm neighbors: type: SVMSN SVM 69547834356 ue: 0.871722 te: 39, shrinki	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 66671120625, kernel: linea king: True, tol: 0.0363577	0.039959228050: 27, smo_grp: Under	O.791 ee: 3, gamma, probability: {cv: 7, estimate: LR 0.8996}, subcom_state: 36 0.779 ee: 2, gamma, probabilitysub: {estimate: 4, gamma, probabilitysub: 4, gamma, probabilitysub: {estimate: 4, gamma, probabilitysub: 4, gamma, probabi
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifier scale, gan False, ranc tor: Minii voting: so	al_featur C}} 29 : {C: 11. ma_valu om_stat ne, rande 36 : {C: over: 11 over: 7, 1 over: 7, 2 over: 39 : {C: 11 ma_valu dom_stat atchKM ft}}	sne+newton-c, res: True, k_1 SVM 88297693107 sie: 4.4366912 sie: 29, shrinki om_state: 29, LR 33.96619927. +liblinear, rm_neighbors: type: SVMSN SVM 69547834356 ue: 0.871722 te: 39, shrinki eleans, randon	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 66671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI	0.039959228050: 27, smo_grp: Under resampling 12038533, degre r, name: SVM 69463377}, sub 6077576085770 601930468, rander resampling 1100513, degre ur, name: SVM 8439167239}, sub 6100518, type: Clus 6100518, type: Clus	063832}, sub OVER, type 0.791 0.791 ee: 3, gamma , probability : {cv: 7, esti sThreshold} 0.795 name: LR 08996}, sub om_state: 36 0.779 ee: 2, gamma , probability sub: {estima
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifier scale, gan False, random tor: MiniE	al_featur C}} 29 : {C: 11. ma_valu lom_stat ne, rande 36 : {C: over: 7, over: 7, over: 7, sover: 7, sover: 11 dom_stat atchKM	sne+newton-c, res: True, k_1 SVM 88297693107 se: 29, shrinki e: 29, shrinki 133.96619927. 14-liblinear, rm neighbors: type: SVMSN SVM 69547834356 ue: 0.871722 te: 39, shrinki	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 66671120625, kernel: linea king: True, tol: 0.0363577	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 89463377}, sub nstanceHardnes Over resampling 157146818768, 0677576085770 01930468, rando Under resampling 1100513, degree ur, name: SVM 8439167239}, sub DER, type: Clustoper	0.791- ee: 3, gamma, probability: {cv: 7, esti SThreshold} 0.795- name: LR 08996}, sub 0.779- ee: 2, gamma, probabilitysub: {estima
{classifierauto, gam True, rand mator: No Random {classifierauto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifierscale, gan false, random tor: Minii voting: so Random	al_featurC} 29 : {C: 11. ma_valutom_stat ne, rande 36 : {C: 11. over: 11. over: 11. over: 39 : {C: 11. nma_valutom_stat dom_stat statchKM ftt} 59	sne+newton-c, res: True, k_1 SVM 88297693107 se: 29, shrinki e: 29, shrinki 1-liblinear, r m_neighbors: type: SVMSN SVM 69547834356 ue: 0.871722 te: 39, shrinki leans, randon LR	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE}} ClusterCentroids 6305, coef0: 0.1955596992 66671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI ADASYN	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 59463377}, sub nstanceHardnes Over resampling 157146818768, cof77576085770 11930468, rande Under resampling 1100513, degree ur, name: SVM 8439167239}, sDER, type: Clus	0.791 ee: 3, gamma, probability (2.795) name: LR (2.896), sub- om_state: 36 0.779 ee: 2, gamma, probability (2.896), sub- om_state: 36 0.779 ee: 2, gamma, probability (2.896), sub- com_state: 36 0.779
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, rantor: MiniE voting: so Random {classifier scale, gan False, gan Fal	al_featurC} 29	see+newton-c, res: True, k_1 SVM 88297693107 see: 29, shrinki e: 29, shrinki 1+liblinear, rm neighbors: type: SVMSN SVM SVM 69547834356 ue: 0.871722 te: 39, shrinki leans, randon LR 29.927183626	g, random_state: 27, tol: 0 neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 66671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI ADASYN 8834317, 11_ratio: 0.4815	0.039959228050: 27, smo_grp: Under	0.791 ee: 3, gamma, probability: {cv: 7, esti SThreshold} 0.795 name: LR 08996}, sub 0.779 ee: 2, gamma, probability sub: {estimasterCentroids}
[categoric SMOTEN Random Classifier auto, gam True, rand mator: No Random Classifier penalty_sc {k_neighb smo_grp: Random Classifier scale, gan False, rantor: MiniE voting: so: Random Classifier penalty_sc Penalt	al_featur C}} 29 : {C: 11. ma_valu lom_stat ne, rande 36 : {C: over: 11 over: 7, 1 over, 39 : {C: 11. nma_valu dom_sta statchKM ft}} 59 : {C: 22 over: 12 over: 13	sne+newton-c, res: True, k_1 SVM 88297693107 sie: 4.4366911 sie: 29, shrinki om_state: 29, LR 33.96619927. 1+liblinear, rm_neighbors: type: SVMSN SVM SVM LR LR LR LR LR 29.927183626 LR 29.927183626 LR 29.927183626 LR	g, random_state: 27, tol: 0.neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 (6671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI ADASYN 1834317, 11_ratio: 0.4815 dom_state: 59, tol: 0.0	0.039959228050: 27, smo_grp: Under	0.791 ee: 3, gamma, probability: {cv: 7, esti SThreshold} 0.795 name: LR 08996}, sub 0.779 ee: 2, gamma, probability sub: {estimasterCentroids}
{categoric SMOTEN Random {classifier auto, gam True, rand mator: No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifier scale, gan False, rantor: MiniE voting: soc Random {classifier penalty_sc {n_neighb smo_grp: Random } {classifier scale, gan False, rantor: MiniE voting: soc Random {classifier penalty_sc {n_neighb smo_grp: Random } {classifier scale, gan Random	al_featurC} 29 : {C: 11. ma_valu lom_stat ne, rande 36 : {C: oVER, 39 : {C: 11. hma_valu dom_sta fect 11. hma_valu dom_sta fect 12. hma_valu dom_sta fect 13. hma_valu dom_sta fect 14. hma_valu dom_sta fect 15. hma_valu hma_va	sne+newton-c, res: True, k_1 SVM 88297693107 sie: 4.436691; e: 29, shrinki; som_state: 29, LR 33.96619927; 1+liblinear, r m_neighbors: type: SVMSN SVM 69547834356 ue: 0.871722 te: 39, shrinki leans, randon LR LR 29.927183626 1+saga, ran-random_state:	g, random_state: 27, tol: 0.neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 66671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI ADASYN 6834317, 11_ratio: 0.4815 dom_state: 59, tol: 0.0 59, smo_grp: OVER, type: 1.000000000000000000000000000000000000	0.039959228050: 27, smo_grp: Under	0.779 De: 2, gamma, probability sub: {estimasterCentroids} 0.791 0.791 0.791 0.791 0.795 0.795 0.779 0.779 0.779 0.779 0.779 0.779 0.779 0.779 0.802
[categoric SMOTEN Random Classifier auto, gam True, rand mator: No Random Classifier penalty_sc {k_neighb smo_grp: Random Classifier scale, gan False, rantor: MiniE voting: so: Random Classifier penalty_sc Penalt	al_featur C}} 29 : {C: 11. ma_valu lom_stat ne, rande 36 : {C: over: 11 over: 7, 1 over, 39 : {C: 11. nma_valu dom_sta statchKM ft}} 59 : {C: 22 over: 12 over: 13	sne+newton-c, res: True, k_1 SVM 88297693107 sie: 4.4366911 sie: 29, shrinki om_state: 29, LR 33.96619927. 1+liblinear, rm_neighbors: type: SVMSN SVM SVM LR LR LR LR LR 29.927183626 LR 29.927183626 LR 29.927183626 LR	g, random_state: 27, tol: 0.neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 (6671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI ADASYN 1834317, 11_ratio: 0.4815 dom_state: 59, tol: 0.0	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 89463377}, sub nstanceHardnes Over resampling 157146818768, 0677576085770 1930468, rando Under resampling 1100513, degree ur, name: SVM 8439167239}, sub proposition 150528409011, name: SVM 8439167239, sub proposition 150528409011,	0.791 ee: 3, gamma, probability: {cv: 7, esti SThreshold} 0.795 name: LR 08996}, sub 0.779 ee: 2, gamma, probability sub: {estimasterCentroids}
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{categoric SMOTEN Random {classifier auto, gam True, rand march No Random {classifier penalty_sc {k_neighb smo_grp: Random {classifier scale, gam false, rantor: MiniE voting: so: Random {classifier penalty_sc {n_neighb Random {classifier scale, gam false, rantor: MiniE voting: so: Random {classifier penalty_sc {n_neighb Random {classifier scale, gam false, rantor: MiniE voting: so: Random {classifier scale, gam false, rantor: MiniE voting: so: Random {classifier scale, gam false,	al_feature C}} 29 : {C: 11. ma_valutom_stat ne, rando 36 : {C: over: 11 over: 7, roover, 39 : {C: 11. ma_valutom_stat dom_stat dom_stat satchKMft}} 59 : {C: 2 over: 1 over: 1, roover, 1,	see+newton-cyres: True, k_1 SVM 88297693107 sie: 4.4366912 sie: 29, shrinki som_state: 29, LR 33.96619927. +liblinear, r m_neighbors: type: SVMSN SVM 69547834356 sie: 39, shrinki leans, randon LR 29.927183626 1+saga, ran andom_state: LR 78.174026451	g, random_state: 27, tol: 0.neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 66671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI ADASYN 834317, 11_ratio: 0.4815 dom_state: 59, tol: 0.0 59, smo_grp: OVER, type SMOTENC	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 59463377}, sub-instanceHardnes Over resampling 157146818768, 0677576085770 01930468, rando Under resampling 1100513, degree under resampling under resampling 1100513, degree	0.791 oc: 3, gamma, probability: {cv: 7, estisThreshold} 0.795 name: LR 08996}, sub om_state: 36 0.779 oc: 2, gamma, probability: {estimasterCentroids} 0.802 name: LR 3959}, sub 0.784 name: LR
[categoric SMOTEN Random Classifier auto, gam True, rand mator: No Random Classifier penalty_sc {k_neighb smo_grp: Random Classifier scale, gan False, randor: MiniE voting: so: Random Classifier penalty_sc {n_neighb Random Classifier penalty_sc penalty_sc penalty_sc penalty_sc penalty_sc penalty_sc Classifier penalty_sc penalty_sc Classifier Classifier penalty_sc Classifier Cla	al_feature C}	sne+newton-cres: True, k_1 SVM 88297693107 sie: 4.4366911 e: 29, shrinki som_state: 29, LR 33.96619927. 1+liblinear, r m_neighbors: type: SVMSN SVM 69547834356 ue: 0.871722 te: 39, shrinki leans, randon LR LR 29.927183626 LR andom_state: LR 78.174026451 sne+saga, ran random-staga, ran random-state: LR	g, random_state: 27, tol: 0.neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 266671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI ADASYN 1834317, 11_ratio: 0.4815 dom_state: 59, tol: 0.0 59, smo_grp: OVER, type SMOTENC 169201, 11_ratio: 0.7415. dom_state: 79, tol: 0.083:	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 594633773, sub instanceHardnes Over resampling 157146818768, 0677576085770 1930468, rando Under resampling 1100513, degreer, name: SVM 8439167239}, sub instanceHardnes Over resampling 1100513, degreer, name: SVM 8439167239}, sub instanceHardnes Over resampling 157146818768, sub instanceHardnes Over resampling 15868655197705 1000	0.779 ee: 3, gamma, probability: {cv: 7, est s Threshold} 0.795 name: LF 0.8996}, sut om_state: 30 0.779 ee: 2, gamma, probability: sub: {estima sterCentroids} 0.802 name: LF 3959}, sut 0.784 name: LF 39, sub: {cai
[categoric SMOTEN Random Classifier auto, gam True, rand mator: No Random Classifier penalty_sc {k_neighb smo_grp: Random Classifier scale, gan False, randor: MiniE voting: so: Random Classifier penalty_sc {n_neighb Random Classifier penalty_sc penalty_sc penalty_sc penalty_sc penalty_sc penalty_sc Classifier penalty_sc penalty_sc Classifier Classifier penalty_sc Classifier Cla	al_featurC} 29 : {C: 11. ma_valutom_stat ne, rando 36 : {C: 00lver: 11 ors: 7, 10 ovER, 39 : {C: 11 ma_valdom_stat ne, random_stat ne, random_	sne+newton-cres: True, k_1 SVM 88297693107 sie: 4.4366911 e: 29, shrinki som_state: 29, LR 33.96619927. 1+liblinear, r m_neighbors: type: SVMSN SVM 69547834356 ue: 0.871722 te: 39, shrinki leans, randon LR LR 29.927183626 LR andom_state: LR 78.174026451 sne+saga, ran random-staga, ran random-state: LR	g, random_state: 27, tol: 0.neighbors: 6, random_state Instance HardnessThreshold 71024, coef0: -0.046561661 3661780805, kernel: linea ing: True, tol: 0.067714525 smo_grp: UNDER, type: I: SVMSMOTE 59499, 11_ratio: 0.64944 andom_state: 36, tol: 0. 6, out_step: 0.513280179 MOTE} ClusterCentroids 6305, coef0: 0.1955596992 66671120625, kernel: linea king: True, tol: 0.0363577 n_state: 39, smo_grp: UNI ADASYN 834317, 11_ratio: 0.4815 dom_state: 59, tol: 0.0 59, smo_grp: OVER, type SMOTENC	0.039959228050: 27, smo_grp: Under resampling 12038533, degrer, name: SVM 594633773, sub instanceHardnes Over resampling 157146818768, 0677576085770 1930468, rando Under resampling 1100513, degreer, name: SVM 8439167239}, sub instanceHardnes Over resampling 1100513, degreer, name: SVM 8439167239}, sub instanceHardnes Over resampling 157146818768, sub instanceHardnes Over resampling 15868655197705 1000	0.779 ee: 3, gamma, probability: {cv: 7, estis sThreshold} 0.795 name: LR 0.8996}, sub om_state: 36 0.779 ee: 2, gamma, probability: sub: {estima sterCentroids} 0.802 name: LR 3959}, sub 0.784 name: LR 3959}, sub: {cai

continued on the next column

1	EASI-1	_vs_/ -v	CONTINUED FR	OM FREVIOU	3 COLUMN
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	LR	ADASYN	Over	0.7882
(1 '0	(0.5	5 1 40550 465	645506 11	resampling	7460225
			545596, 11_ratio:		57469235, name: LR,
			90, smo_grp: OV		827436752119}, sub:
Random	109	LR	ADASYN	Over	0.7992
Kandom	109	LK	ADASTN	resampling	0.7992
{classifier	: {C: 2	29.306885540	060576, 11_ratio:		7505884, name: LR,
			lom_state: 109,		711209417332}, sub:
{n_neighb	ors: 1, r	andom_state:	109, smo_grp: O	VER, type: AI	DASYN}}
TPE	9	LR	ADASYN	Over	0.8044
(1 10				resampling	
			355627, 11_ratio:		3462856, name: LR,
					891839498218}, sub:
TPE	18	LR	9, smo_grp: OVI ADASYN	Over	0.8053
IFE	10	LK	ADASTN	resampling	0.8033
{classifier	: {C: 1	7.2401939684	130148, 11 ratio:		70459572, name: LR,
					.697277123998}, sub:
{n_neighb	ors: 1, r	andom_state:	18, smo_grp: OV	ER, type: AD	ASYN}}
TPE	27	LR	SMOTENC	Over	0.7931
				resampling	
			42294, 11_ratio		
			om_state: 27,		
			_neighbors: 4, r	andom_state: 2	27, smo_grp: OVER,
type: SMC			ADASYN	Over	0.000
TPE	29	LR	ADASTN	resampling	0.8029
{classifier	· {C·]	1 76 646303640	19543 11 ratio		1366711, name: LR,
					392380984064}, sub:
			29, smo_grp: OV		
TPE	36	LR	CondensedNear	estInder	0.8046
			Neighbour	resampling	
					78128226, name: LR,
					720671585109}, sub:
			4/, random_state	: 36, smo_grp:	UNDER, type: Con-
densedNea TPE	39	LR	ADASYN	Over	0.8114
IFE	39	LK	ADASIN	resampling	0.6114
{classifier	: {C: 9	91.177095900	060575, 11_ratio:	0.362024761	3057664, name: LR,
					568342637532}, sub:
{n_neighb	ors: 1, r	andom_state:	39, smo_grp: OV	ER, type: AD	ASYN}}
TPE	59	SVM	SVMSMOTE	Over	0.7909
				resampling	
					64, degree: 3, gamma:
					ame: SVM, probabil-
					353581042683}, sub:
				152834559988	797, random_state: 59,
smo_grp:	79	type: SVMSN LR	ADASYN	Over	0.8065
IFL	19	LK	ADASIN	resampling	0.8003
{classifier	: {C: 7	2.052924370	06882, 11 ratio:		8296743, name: LR,
					400903325843}, sub:
			79, smo_grp: OV		
TPE	90	LR	ADASYN	Over	0.8041
				resampling	
{classifier			17037, 11_ratio:		0994873, name: LR,
					120980078878}, sub:
·			90, smo_grp: O\		
TPE	109	LR	ADASYN	Over	0.8051
I classifier	· 1C· 6	3 460626326	56172 11 ratio	resampling 0.3063813354	4668456, name: LR,
			om_state: 109,		
			109, smo_grp: O		
				, JF-: 112	- 7.7

TABLE S-34 "GLASS4"

Grid 18 SVM ADASYN Over 0.923	Method	Seed	Classifier	Resampler	Res.Group	GM
Grid 18 SVM ADASYN Over resampling 0.923 Grid 27 SVM RandomOverSampler Over resampling 0.929 Grid 29 SVM RandomOverSampler Over resampling 0.934 Grid 36 SVM RandomOverSampler Over resampling 0.934 Grid 39 SVM RandomOverSampler Over resampling 0.934 Grid 59 SVM RandomOverSampler Over resampling 0.934 Grid 79 SVM RandomOverSampler Over resampling 0.929 Grid 109 SVM RandomOverSampler Over resampling 0.934 Random 9 SVM ClusterCentroids Under resampling 0.934 (classifier: (C: 178.2155225419878, coeff0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability False, random_state: 9, shrinking: False, tol: 0.09543901231623028), sub: (estimator: MiniBatchKweans, random_state: 9, smo_grp: UNDER, type: RandomUnderSampler Under resampling (classifier: (C: 169.66484193640792, coeff0: 0.09447747297420005, degr	Grid	9	SVM	RandomOverSampler		0.9346
Grid 27 SVM RandomOverSampler Over 0.929 resampling 0.929 resampling 0.929 resampling 0.929 resampling 0.929 resampling 0.921 resampling 0.924 resampling 0.934 resampling 0.93						
Grid 27 SVM RandomOverSampler resampling Over resampling 0.929 Grid 29 SVM RandomOverSampler over resampling 0.923 0.923 Grid 36 SVM RandomOverSampler over resampling 0.934 Grid 39 SVM RandomOverSampler over resampling 0.937 Grid 59 SVM RandomOverSampler over resampling 0.929 Grid 79 SVM RandomOverSampler resampling 0.929 Grid 109 SVM RandomOverSampler resampling 0.937 Grid 109 SVM RandomOverSampler over over over resampling 0.934 Grid 109 SVM ClusterCentroids Under resampling 0.924 Grid 109 SVM ClusterCentroids Under resampling 0.924 (classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma; value: 0.5369190144853789, kernel: rbi, name: SVM, probability 1.09 SVM Random value: 4.88491401448978 1.095434901231403098, sub: (estimator) state: 18, kriniking: frue, toi: 0.0341473924352671341, sub: (rand	Grid	18	SVM	ADASYN		0.9231
Grid 29 SVM RandomOverSampler Over 0.923 resampling 0.923 resampling 0.923 resampling 0.923 resampling 0.924 resampling 0.934 resampling 0.934 resampling 0.934 resampling 0.935 0.936	~		~~~			
Grid 29 SVM RandomOverSampler Over resampling Grid 36 SVM RandomOverSampler Over resampling Grid 39 SVM RandomOverSampler Over 0.934 Grid 59 SVM RandomOverSampler Over 0.937 Grid 59 SVM RandomOverSampler Over 0.938 Grid 79 SVM RandomOverSampler Over 0.939 Grid 90 SVM RandomOverSampler Over 0.939 Grid 109 SVM RandomOverSampler Over 0.934 Random 9 SVM ClusterCentroids Under 0.924 Random 9 SVM ClusterCentroids Under 0.924 Random 9 SVM ClusterCentroids Under 0.924 Grid 109 SVM RandomOverSampler Over 1.934 Random 9 SVM ClusterCentroids Under 0.924 Random 109 SVM RandomOverSampler Over 1.934 Random 109 SVM RandomOverSampler Under 1.932 Random 109 SVM RandomUnderSampler Under 1.932 Random 109 SVM RandomUnderSampler Under 1.932 Random 109 SVM RandomUnderSampler Under 1.932 Random 109 SVM RandomOverSampler Under 1.934 Random 109 SVM RandomOverSampler Vince RandomOverSampler Vince 1.934 Random 109 SVM RandomOverSampler Vince Random 1.934 Random 109 SVM RandomSaverSaverSaverSaverSaverSaverSaverSaver	Grid	27	SVM	RandomOverSampler		0.9292
Grid 36 SVM RandomOverSampler Over cesampling Grid 39 SVM RandomOverSampler Over resampling Grid 39 SVM RandomOverSampler Over resampling Grid 59 SVM RandomOverSampler Over resampling Grid 79 SVM RandomOverSampler Over 0.934 Grid 79 SVM RandomOverSampler Over 0.929 Grid 90 SVM RandomOverSampler Over 0.929 Grid 109 SVM RandomOverSampler Over 0.937 Fesampling Over 0.937 Grid 109 SVM RandomOverSampler Over 0.938 Random 9 SVM ClusterCentroids Under resampling Grid 109 SVM RandomOverSampler Over 0.934 Fesampling Over 0.934 Fesa						
Grid 36 SVM RandomOverSampler Over resampling Grid 39 SVM RandomOverSampler Over resampling Grid 59 SVM RandomOverSampler Over 0.934 Grid 79 SVM RandomOverSampler Over 0.934 Grid 79 SVM RandomOverSampler Over 0.929 Grid 90 SVM RandomOverSampler Over 0.929 Grid 109 SVM RandomOverSampler Over 0.937 Grid 109 SVM RandomOverSampler Over 0.937 Grid 109 SVM RandomOverSampler Over 0.938 Random 9 SVM ClusterCentroids Under 0.924 Random 9 SVM ClusterCentroids Under 0.924 Random 9 SVM ClusterCentroids Under 0.924 gamma: scale, gamma, value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estimator: MiniBatchKweans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard} Random 18 SVM RandomUnderSampler Under 0.922 [classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: (random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler] Random 27 KNN SMOTETomek Combine 0.904 [classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability True, random_state: 29, shrinking: True, tol: 0.03191230894212939), sub: {random_state: 36, smo_grp: COMBINE, type: SMOTETOmek} Random 36 KNN SMOTETomek Combine 0.897 [classifier: {c: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 36, smo_grp: COMBINE, type: SMOTETOmek} Random 39 DT SVMSMOTE Over 0.94 [classifier: {c: 166.06685053924164	Grid	29	SVM	RandomOverSampler	Over	0.9234
Grid 39 SVM RandomOverSampler Over 0.937					resampling	
Grid 39 SVM RandomOverSampler resampling Over resampling 0.937 Grid 59 SVM RandomOverSampler Over resampling 0.934 Grid 79 SVM RandomOverSampler Over resampling 0.929 Grid 90 SVM RandomOverSampler Over resampling 0.934 Grid 109 SVM RandomOverSampler Over resampling 0.934 Random 9 SVM ClusterCentroids Under resampling 0.924 (classifier: (C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma csale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098], sub: (estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18 SVM RandomUnderSampler Under resampling (classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma scale, gamma_value: 6.0991363942821845, kernel: poly, name: SVM, probability: True, random_state: 18, krinking: True, tol: 0.023147392435267134}, sub: (random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler] Combine resampling 0.904 {classifier:	Grid	36	SVM	RandomOverSampler	Over	0.9346
Grid 59 SVM RandomOverSampler Over 0.934					resampling	
Grid 59 SVM RandomOverSampler resampling Over resampling 0.934 resampling Grid 79 SVM RandomOverSampler Over resampling 0.937 resampling Grid 109 SVM RandomOverSampler Over resampling 0.937 resampling Random 9 SVM ClusterCentroids Under resampling 0.924 resampling {classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098), sub: {estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard} Random 18 SVM RandomUnderSampler Under resampling {classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability probability True, random_state: 18, shrinking: True, tolom_state: Symptom_state: 18, shrinking: True, tol: 0.0231473924352671341, sub: (random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler) Random 27 KNN SMOTETomek Combine combine resampling {classifier:<	Grid	39	SVM	RandomOverSampler	Over	0.9374
Grid 79 SVM RandomOverSampler Over 0.929 Grid 90 SVM RandomOverSampler Over 0.937 Grid 109 SVM RandomOverSampler Over 0.934 Random 9 SVM RandomOverSampler Over 0.934 Random 9 SVM ClusterCentroids Under 0.924 resampling (classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: [esti mator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18 SVM RandomUnderSampler Under 0.922 (classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random 27 KNN SMOTETomek Combine 0.904 (classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state: 72, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTETomek}} Random 29 SVM Neighbourhood Under resampling (classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma_scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub: {n.neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type: NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine 0.897 resampling (classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36, smo_grp: COMBINE, type: SMOTETomek}} Random 39 DT SVMSMOTE Over 0.94 resampling (classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 3, random_state: 36, smo_grp: COMBINE, type: SMOTETomek} Random 39 DT SVMSMOTE None: sampling (classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf, n.neighbors: 6, out. step: 0.49234462961811976, random_state: 39, smo_grp: OVER ty					resampling	
Grid 79 SVM RandomOverSampler Over resampling Grid 90 SVM RandomOverSampler Over 0.937 Grid 109 SVM RandomOverSampler Over 0.934 Random 9 SVM RandomOverSampler Over 0.934 Random 9 SVM ClusterCentroids Under 0.924 resampling Classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18 SVM RandomUnderSampler Under 0.922 (classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma_scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random 27 KNN SMOTETomek Combine 0.904 resampling (classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state: 27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTETomek}} Random 29 SVM Neighbourhood Under resampling (classifier: {C: 166.06685053924164, coeff0: 0.5397052376789149, degree: 3, gamma scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub: {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type Neighbourhood CleaningRule}} Random 30 KNN SMOTETomek Combine resampling {classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36, smo_grp: COMBINE, type: SMOTETOmek}} Random 39 DT SVMSMOTE Over 0.94 resampling (classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39}, smo_grp: OVER type: SVMSMOTE}} Ran	Grid	59	SVM	RandomOverSampler	Over	0.9346
Grid 90 SVM RandomOverSampler Over 0.937. Grid 109 SVM RandomOverSampler Over 0.934. Random 9 SVM ClusterCentroids Under 0.924. Random 19 SVM ClusterCentroids Under 0.924. Random 19 SVM RandomOverSampler Versampling (classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: (estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18 SVM RandomUnderSampler Under 0.922						
Grid 90 SVM RandomOverSampler Over resampling Grid 109 SVM RandomOverSampler Over resampling Random 9 SVM ClusterCentroids Under resampling Classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18 SVM RandomUnderSampler Under resampling Classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random 27 KNN SMOTETomek Combine resampling Classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state: 27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTETomek}} Random 29 SVM Neighbourhood Under resampling Classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma_scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939), sub: {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine 0.897. resampling Classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36, smo_grp: COMBINE, type: SMOTETOmek}} Random 39 DT SVMSMOTE Over 0.94 resampling 0.994 Classifier: {criterion: entropy, max_depth: 18, max_features: sqr, min_samples_leat 9, min_samples_split: 2, name: DTC, random_state: 39, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random 79 DT SMOTEENN Combine 10.992	Grid	79	SVM	RandomOverSampler	Over	0.9292
Grid 109 SVM RandomOverSampler Over resampling						
Grid 109 SVM RandomOverSampler Over resampling Random 9 SVM ClusterCentroids Under 0.924 [classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098], sub: [estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}] Random 18 SVM RandomUnderSampler Under resampling [classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma csale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability: True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: [random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler] Random 27 KNN SMOTETomek Combine resampling [classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state: 27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTETomek}} Random 29 SVM Neighbourhood Under resampling [classifier: {C: 166.06688053924164, coef0: 0.5397052376789149, degree: 3, gamma csale, gamma_value: 4.888746036015425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939), sub {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine resampling [classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36, smo_grp: COMBINE, type: SMOTETomek}} Random 39 DT SVMSMOTE Over resampling [classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leat 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39}, smo_grp: OVER type: SVMSMOTE}} Random 59 DT SMOTEENN Combine 0.921 [classifier: {criterion: entropy, max_depth: 10, max_features: None, min_samples_leat 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59}, smo_grp	Grid	90	SVM	RandomOverSampler	Over	0.9374
Random 9 SVM ClusterCentroids Under resampling (classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estility: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estility: False, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18 SVM RandomUnderSampler Under resampling (classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random 27 KNN SMOTETomek Combine resampling (classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state: 27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTETomek} Random 29 SVM Neighbourhood Under resampling (classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub: {m.neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule} Random 36 KNN SMOTETomek Combine resampling (classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36, smo_grp: COMBINE, type: SMOTETomek} Random 39 DT SVMSMOTE Over 0.94 {classifier: {criterion: entropy, max_depth: 18, max_features: sqr, min_samples_leaf 9, min_samples_split: 2, name: DTC, random_state: 39, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE} Random 59 DT SMOTEENN Combine resampling (classifier: {criterion: entropy, max_depth: 10, max_features: None, min_samples_leaf 3, min_samples_split: 2, name: DTC, random_state: 59, sub: {random_state: 59, smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMO					resampling	
Random 9 SVM ClusterCentroids Under resampling Classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18 SVM RandomUnderSampler Under resampling Classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma_scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random 27 KNN SMOTETomek Combine resampling Classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state: 27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTE Tomek} Random 29 SVM Neighbourhood Under resampling Classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma_scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub: {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule} Random 36 KNN SMOTETomek Combine resampling Classifier: {citerion: entropy, max_depth: 18, max_features: sqrt, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39}, smo_grp: OVER type: SVMSMOTE} DT SMOTEENN SMOTEENN SMOTEENN Combine resampling Classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39}, sub: {sandom_state: 59}, sub: {rando	Grid	109	SVM	RandomOverSampler	Over	0.9346
classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random					resampling	
[classifier: {C: 178.21552256419878, coef0: -0.46612314101013586, degree: 2 gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estimator: MiniBatchkMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18 SVM RandomUnderSampler Under resampling Under resampling Under resampling Classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random 27	Random	9	SVM	ClusterCentroids	Under	0.9242
gamma: scale, gamma_value: 0.5369190164853789, kernel: rbf, name: SVM, probability: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random			<u> </u>	<u> </u>		
bility: False, random_state: 9, shrinking: False, tol: 0.09543901231623098}, sub: {estimator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random 18	{classifier:	{C:	178.21552256	6419878, coef0: -0.46612	314101013586	, degree: 2
mator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random	gamma: so	cale, gar	nma_value: ().5369190164853789, kern	el: rbf, name:	SVM, proba-
mator: MiniBatchKMeans, random_state: 9, smo_grp: UNDER, type: ClusterCentroids voting: hard}} Random	bility: Fals	se, rando	m_state: 9, sl	hrinking: False, tol: 0.0954	3901231623098	3}, sub: {esti-
Random 18 SVM RandomUnderSampler Under cesampling						
Random 18 SVM RandomUnderSampler Under resampling Classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma_scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random 27					, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	
resampling			SVM	RandomUnderSampler	Under	0.9222
[classifier: {C: 169.66484193640792, coef0: 0.0949747297420005, degree: 2, gamma scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability: True, random_state: 18, strinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random 27 KNN SMOTETOmek Combine resampling 0.904 {classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state: 27, smo_grp: COMBINE, type: SMOTETOmek}} Under resampling 0.918 Random 29 SVM Neighbourhood CleaningRule Under resampling 0.918 {classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub: n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine resampling {classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 0.897 Rendom 39 DT SVMSMOTE Over resampling {classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leat 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39}, smo_grp: OVER						
scale, gamma_value: 6.0091363942821845, kernel: poly, name: SVM, probability True, random_state: 18, srinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random	Lelassifier	JC: 16	9 664841936/	10792 coef0: 0.094974729	7420005 degre	e. 2 gamma
True, random_state: 18, shrinking: True, tol: 0.023147392435267134}, sub: {random_state: 18, replacement: False, smo_grp: UNDER, type: RandomUnderSampler} Random						
Random 27						
Random 27 KNN SMOTETomek Combine resampling Classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state 27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTETOMEK} Random 29 SVM Neighbourhood Under resampling Classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma_scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub: {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type: NeighbourhoodCleaningRule} Random 36 KNN SMOTETomek Combine resampling Classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36, smo_grp: COMBINE, type: SMOTETOMEK} Random 39 DT SVMSMOTE Over resampling Classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leat 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE} DT SMOTEENN Combine resampling Classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leat 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59}, sub: {ra						
classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state 27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTE Tomek}} Random						
[classifier: {algorithm: ball_tree, n_neighbors: 10, name: KNN, p: 16, random_state 27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTE TOmek}} Random 29 SVM Neighbourhood CleaningRule resampling Under resampling 0.918 {classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma csale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probability: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine resampling {classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 eweights: uniform}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTETomek}} 0.94 Random 39 DT SVMSMOTE Over resampling {classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leat} 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6 m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random 59 DT SMOTEENN Combine resampling {classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leat} 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59} smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMOTETomek Combine	Random	27	KNN	SMOTETomek		0.9046
27, weights: distance}, sub: {random_state: 27, smo_grp: COMBINE, type: SMOTE Tomek}} Random 29 SVM Neighbourhood Under resampling 0.918 {classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probabil tity: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine 0.897. resampling 0.94.						
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Random 29 SVM Neighbourhood Under resampling CleaningRule Under resampling (classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probabil ity: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine resampling Classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36, smo_grp: COMBINE, type: SMOTETomek} Over resampling Classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leat 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE} DT SMOTEENN Combine resampling Classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leat 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59}, sub		ts: distai	ice}, sub: {ra	indom_state: 27, smo_grp:	COMBINE, ty	pe: SMOTE-
CleaningRule resampling						•
[classifier: {C: 166.06685053924164, coef0: 0.5397052376789149, degree: 3, gamma scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probabil ity: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, subt {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine resampling 0.897 resampling {classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 weights: uniform}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTETomek}} Over resampling 0.94 resampling {classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6 m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random 59 DT SMOTEENN Combine resampling 0.921 resampling {classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leaf3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59} smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMOTETomek Combine Combine resampling Romom 79 DT SMOTETomek Combine Combine resampling	Random	29	SVM			0.9183
scale, gamma_value: 4.8887460360115425, kernel: poly, name: SVM, probabil ity: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine resampling 0.897 {classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 tweights: uniform}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTETomek}} Random 39 DT SVMSMOTE Over resampling 1.94 {classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6m_neighbors: 6m_neigh			L			
ity: True, random_state: 29, shrinking: True, tol: 0.03191230894212939}, sub {n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine resampling 0.897 {classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 weights: uniform}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTETomek}} Random 39 DT SVMSMOTE Over resampling {classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6 m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random 59 DT SMOTEENN Combine 0.921* {classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leaf 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59} smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMOTETomek Combine 0.972						
{n_neighbors: 17, smo_grp: UNDER, threshold_cleaning: 0.07049885115861221, type NeighbourhoodCleaningRule}} Random 36 KNN SMOTETomek Combine resampling 0.897. {classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36						
NeighbourhoodCleaningRule Random 36 KNN SMOTETomek Combine 0.897						
Random 36 KNN SMOTETomek Combine resampling 0.897. {classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 state: 36, smo_grp: COMBINE, type: SMOTE Tomek} Random 39 DT SVMSMOTE Over resampling 0.94 {classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE} Random 59 DT SMOTEENN Combine resampling 0.921 resampling {classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leaf 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59} smo_grp: COMBINE, type: SMOTEENN} Random 79 DT SMOTETomek Combine 0.972	{n_neighb	ors: 17,	smo_grp: UN	DER, threshold_cleaning: 0	0.07049885115	861221, type:
classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 weights: uniform}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTE Tomek}} Random 39 DT	Neighbour	hoodCle	eaningRule}}			
{classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 weights: uniform}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTE Tomek}} Random	Random	36	KNN	SMOTETomek	Combine	0.8972
{classifier: {algorithm: brute, n_neighbors: 9, name: KNN, p: 13, random_state: 36 weights: uniform}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTE Tomek}} Random 39 DT SVMSMOTE Over resampling 0.94			1		resampling	
weights: uniform}, sub: {random_state: 36, smo_grp: COMBINE, type: SMOTE Tomek}} Random 39 DT SVMSMOTE Over resampling 0.94 {classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leat} 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6 m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random 59 DT SMOTEENN Combine resampling 0.921 {classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leat} 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59 smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMOTETOmek Combine 0.972	{classifier:	{algori	thm: brute. r	neighbors: 9, name: KN		om state: 36.
Tomek Random 39						
Random 39 DT SVMSMOTE Over resampling (classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6 m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random 59 DT SMOTEENN Combine resampling (classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leaf 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59} smo_grp: COMBINE, type: SMOTEENN} Random 79 DT SMOTETOMER Combine 0.972			, (, -5)	
resampling	,,	39	DT	SVMSMOTE	Over	0.948
{classifier: {criterion: entropy, max_depth: 18, max_features: sqrt, min_samples_leaf 9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6 m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random	Landoni	37		S.Monore		0.540
9, min_samples_split: 2, name: DTC, random_state: 39}, sub: {k_neighbors: 6} m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random	{classifier	{criteri	on: entropy	max denth: 18 max featu		samples leaf
m_neighbors: 6, out_step: 0.49234462961811976, random_state: 39, smo_grp: OVER type: SVMSMOTE}} Random						
type: \$VMSMOTE}} Random 59 DT SMOTEENN Combine resampling 0.921 {classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leat 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59} smo_grp: COMBINE, type: \$MOTEENN}} Random 79 DT SMOTETomek Combine 0.972						
Random 59 DT SMOTEENN Combine resampling 0.921 {classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leat 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59} smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMOTETomek Combine 0.972				237702701011770, 1andOlli	_state. 39, 8ill0	_grp. OVER
{classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leaf 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59 smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMOTETomek Combine 0.972				CMOTEENN	C1.	0.0015
{classifier: {criterion: gini, max_depth: 10, max_features: None, min_samples_leaf 3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59 smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMOTETomek Combine 0.972	type: SVM		וט	5MOTEENN		0.9217
3, min_samples_split: 2, name: DTC, random_state: 59}, sub: {random_state: 59} smo_grp: COMBINE, type: SMOTEENN}} Random 79 DT SMOTETomek Combine 0.972		59	1			
smo_grp: COMBINE, type: SMOTEENN} Random 79 DT SMOTETomek Combine 0.972	type: SVM Random		<u> </u>	1 (1 10 °		
Random 79 DT SMOTETomek Combine 0.972	type: SVN Random {classifier:	: {criter				
	Random {classifier: 3, min_sa	: {criter mples_s	plit: 2, name	e: DTC, random_state: 59		
	type: SVN Random {classifier: 3, min_sa smo_grp:	: {criter mples_s COMBI	plit: 2, name NE, type: SM	e: DTC, random_state: 59 IOTEENN}})}, sub: {rando	om_state: 59,
resumpting	Random {classifier: 3, min_sa	: {criter mples_s COMBI	plit: 2, name NE, type: SM	e: DTC, random_state: 59 IOTEENN}})}, sub: {rando	
{classifier: {criterion: entropy, max_depth: 6, max_features: sqrt, min_samples_leaf	type: SVN Random {classifier: 3, min_sa smo_grp:	: {criter mples_s COMBI	plit: 2, name NE, type: SM	e: DTC, random_state: 59 IOTEENN}})}, sub: {rando	om_state: 59
17, min_samples_split: 15, name: DTC, random_state: 79}, sub: {random_state: 79}	type: SVM Random {classifier: 3, min_sa smo_grp: Random	{criter mples_s COMBI 79	plit: 2, name NE, type: SM DT	e: DTC, random_state: 59 MOTEENN}} SMOTETomek	Combine resampling	0.9721
smo_grp: COMBINE, type: SMOTETomek}}	type: SVM Random {classifier: 3, min_sa smo_grp: Random {classifier:	criter mples_s COMBI 79	plit: 2, name NE, type: SM DT ion: entropy,	e: DTC, random_state: 59 IOTEENN}} SMOTETomek max_depth: 6, max_feature	Combine resampling res: sqrt, min_s	om_state: 59 0.9721 samples_leaf

TABLE S-34 "GLASS4" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	CondensedNearest Neighbour	Under resampling	0.9143
{classifier	: {bootst	rap: False, cl	ass_weight: balanced, crit		x_features: 1,
			les_split: 13, n_estimators		
			eeds_S: 44, random_state:	90, smo_grp: U	NDER, type:
Random	109	Neighbour}} KNN	SMOTEENN	Combine	0.9219
Kandom	10)	IXIVIV	SMOTEENIN	resampling	0.5215
			n_neighbors: 15, name: random_state: 109, smo_g		
TEENN}}			andoni_state: 100, sino_g	.p. combine	, type: Silie
TPE	9	KNN	SMOTE	Over resampling	0.9192
{classifier	: {algori	thm: auto, n	_neighbors: 14, name: K		dom_state: 9,
weights: u		, sub: {k_ne	ighbors: 7, random_state:	9, smo_grp:	OVER, type:
TPE	18	SVM	RandomUnderSampler	Under	0.9477
{classifier	{C: 28.	14146167870	 133, coef0: -0.659625862	resampling 6741562, degre	e: 2. gamma:
			72023263, kernel: sigmoi		
			king: False, tol: 0.05233		
dom_state TPE	: 18, rep		se, smo_grp: UNDER, ty NearMiss	pe: RandomUno Under	
IPE	21	SVM	Nearwiss	resampling	0.9174
{classifier	C: 131	.6578892921	9568, coef0: -0.217707044		ee: 2, gamma:
			01914286417, kernel: line		
			shrinking: True, tol: 0.0		
{n_neighb 1}}	ors: 4, r	_neignbors_v	/er3: 11, smo_grp: UNDE	k, type: Nearn	Aiss, version:
TPE	29	SVM	SMOTEENN	Combine	0.9158
				resampling	
			5357, coef0: 0.402312367		
)2010804, kernel: poly, narrue, tol: 0.0475138575008		
			SMOTEENN}}	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	undom_suute.
TPE	36	RF	BorderlineSMOTE	Over	0.926
(alossifiar	(boote	tron: Truo o	 lass_weight: balanced_su	resampling	ion: ontrony
			eaf: 15, min_samples_spli		
		50}, sub: {	k_neighbors: 6, kind: bo	orderline-2, m_i	
TPE	ate: 36,	smo_grp: OV	ER, type: BorderlineSMC	TE}}	neighbors: 8,
				TE}} Over	
{classifier	ate: 36,	smo_grp: OV DT	ER, type: BorderlineSMC SVMSMOTE	TE}} Over resampling	0.9532
	ate: 36, 39 : {criteri	smo_grp: OV DT on: entropy, 1	ER, type: BorderlineSMC	Over resampling res: sqrt, min_s	neighbors: 8, 0.9532 samples_leaf:
3, min_sa m_neighbo	ate: 36, 39 : {criteri imples_s ors: 2, or	on: entropy, 1 plit: 5, name at_step: 0.024	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu	OTE}} Over resampling res: sqrt, min_s 39}, sub: {k_r	neighbors: 8, 0.9532 samples_leaf: neighbors: 5,
3, min_sa m_neighbo type: SVN	ate: 36, 39 : {criteriumples_s ors: 2, or	smo_grp: OV DT on: entropy, 1 plit: 5, name at_step: 0.024	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state: 1.15029231026664, random	Over resampling res: sqrt, min_:39}, sub: {k_ra_state: 39, smo	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER,
3, min_sa m_neighbo	ate: 36, 39 : {criteri imples_s ors: 2, or	on: entropy, 1 plit: 5, name at_step: 0.024	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state:	OTE}} Over resampling res: sqrt, min_s 39}, sub: {k_r	neighbors: 8, 0.9532 samples_leaf: neighbors: 5,
3, min_sa m_neighbotype: SVM TPE	ate: 36, 39 : {criteri amples_s ors: 2, or 4SMOTE 59	smo_grp: OV DT on: entropy, 1 plit: 5, name itt_step: 0.024 E}} KNN rithm: ball_t	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state: 15029231026664, random SVMSMOTE ree, n_neighbors: 12, 1	Over resampling res: sqrt, min_say}, sub: {k_r_state: 39, smo	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER, 0.9024 p: 13, ran-
3, min_sa m_neighbo type: SVM TPE {classifier dom_state	ate: 36, 39 : {criteri imples_s ors: 2, or 4SMOTE 59 : {algor : 59, we	smo_grp: OV DT on: entropy, 1 plit: 5, nam. at_step: 0.024 E} KNN ithm: ball_t	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state: 15029231026664, random SVMSMOTE ree, n_neighbors: 12, 1 m}, sub: {k_neighbors: 6	Over resampling res: sqrt, min_s 39}, sub: {k_r state: 39, smo Over resampling name: KNN, m_neighbors:	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER, 0.9024 p: 13, ran- 3, out_step:
3, min_sa m_neighbo type: SVM TPE {classifier dom_state 0.1404242	ate: 36, 39 : {criteri umples_s ors: 2, or 4SMOTE 59 : {algor : 59, we :7752290	smo_grp: OV DT on: entropy, 1 plit: 5, nam at_step: 0.024 }} KNN ithm: ball_t ights: unifor 5, random_st	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state: 15029231026664, random SVMSMOTE ree, n_neighbors: 12, 1 m}, sub: {k_neighbors: 6 ate: 59, smo_grp: OVER,	Over resampling res: sqrt, min_; 39}, sub: {k_r} _state: 39, smo Over resampling name: KNN, m_neighbors: type: SVMSM	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER, 0.9024 p: 13, ran- 3, out_step: OTE}}
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3, min_sa m_neighbotype: SVM TPE {classifier dom_state 0.1404242 TPE {classifier 19, min_s	ate: 36, 39 : {criteri mples_s pors: 2, out 4SMOTE 59 : {algorites for the form of the f	smo_grp: OV DT on: entropy, 1 plit: 5, nam at_step: 0.024 } KNN ithm: ball_t eights: unifor 15, random_st DT on: entropy, 1 split: 2, nam	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state: 2.15029231026664, random SVMSMOTE ree, n_neighbors: 12, 1 m}, sub: {k_neighbors: 6 ate: 59, smo_grp: OVER, SMOTETomek max_depth: 13, max_featu e: DTC, random_state: 7	Over resampling res: sqrt, min_syl, sub: {k_1 state: 39, smo} Over resampling resampling resempling resampling resampling ressuppling resampling ressuppling respective respective ressuppling ressuppling ressuppling ressup	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, pgrp: OVER, 0.9024 p: 13, ran- 3, out_step: OTE}} 0.9746 samples_leaf:
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3, min_sa m_neighbotype: SVM TPE {classifier dom_state 0.1404242 TPE {classifier 19, min_s	ate: 36, 39 : {criteri mples_s pors: 2, out 4SMOTE 59 : {algorites for the form of the f	smo_grp: OV DT on: entropy, 1 plit: 5, nam at_step: 0.024 } KNN ithm: ball_t eights: unifor 15, random_st DT on: entropy, 1 split: 2, nam	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state: 2.15029231026664, random SVMSMOTE ree, n_neighbors: 12, 1 m}, sub: {k_neighbors: 6 ate: 59, smo_grp: OVER, SMOTETomek max_depth: 13, max_featu e: DTC, random_state: 7	Over resampling res: sqrt, min_syl, sub: {k_1 state: 39, smo} Over resampling resampling resempling resampling resampling ressuppling resampling ressuppling respective respective ressuppling ressuppling ressuppling ressup	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, pgrp: OVER, 0.9024 p: 13, ran- 3, out_step: OTE}} 0.9746 samples_leaf:
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3, min_sa m_neighb type: SVM TPE {classifier dom_state 0.1404242 TPE {classifier 19, min_s smo_grp: TPE {classifier scale, gam random_st	ate: 36, 39 : {criteri mples_s ors: 2, order of the series of the serie	smo_grp: OV DT on: entropy, 1 plit: 5, nam at_step: 0.024 } KNN ithm: ball_t ights: unifor 5, random_st DT on: entropy, 1 split: 2, nam NE, type: SM SVM 4.7606505362 e: 3.6475528' shrinking: Tru	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state: 2.15029231026664, random SVMSMOTE ree, n_neighbors: 12, n m}, sub: {k_neighbors: 6 ate: 59, smo_grp: OVER, SMOTETomek max_depth: 13, max_featu e: DTC, random_state: 7 OTETomek}} CondensedNearest Neighbour 1302, coef0: 0.451451925 799890116, kernel: rbf, na	Over resampling res: sqrt, min_s39}, sub: {k_r_state: 39, smo} Over resampling res: sqrt, min_state: 39, smo Over resampling res: sqrt, min_sype: SVMSM Combine resampling res: sqrt, min_sype; sqrt, min_sy	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER, 0.9024 p: 13, ran- 3, out_step: OTE}} 0.9746 samples_leaf: pm_state: 79, 0.9266 ee: 2, gamma: ability: False, neighbors: 16,
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3, min_sa m_neighb type: SVM TPE {classifier dom_state 0.1404242 TPE {classifier 19, min_s smo_grp: TPE {classifier scale, gam random_st n_seeds_S bour}}	ate: 36, 39 : {criteri imples_s ors: 2, order of the content of t	smo_grp: OV DT on: entropy, 1 plit: 5, nam at_step: 0.024 } KNN ithm: ball_t ights: unifor 5, random_st DT on: entropy, 1 split: 2, nam NE, type: SM SVM 4.7606505362 e: 3.6475528' shrinking: Tradom_state: 9 SVM	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featte: DTC, random_state: :15029231026664, random SVMSMOTE ree, n_neighbors: 12, nml, sub: {k_neighbors: 6} ate: 59, smo_grp: OVER, SMOTETomek max_depth: 13, max_featte: DTC, random_state: 7 OTETomek}} CondensedNearest Neighbour 1302, coef0: 0.451451925 799890116, kernel: rbf, na ne, tol: 0.08343157435387 no, smo_grp: UNDER, type ClusterCentroids	Over resampling res: sqrt, min_sqs}, sub: {k_r_state: 39, smo} Over resampling research resampling research resampling research resampling res: sqrt, min_sqs}, sub: {randor resampling res: condensed resampling res: Condensed resampling resampling resampling resampling resampling resampling resampling	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER, 0.9024 p: 13, ran- 3, out_step: OTE} 0.9746 samples_leaf: pm_state: 79, 0.9266 ee: 2, gamma: ability: False, neighbors: 16, NearestNeigh-
3, min_sa m_neighb type: SVM TPE {classifier dom_state 0.1404242 TPE {classifier 19, min_s smo_grp: TPE {classifier scale, gam random_st n_seeds_S bour}}	ate: 36, 39 : {criteriumples_s ors: 2, ordsMOTE 59 : {algor: 59, we.77752290 79 : {criteriamples_c orma_valuate: 90, : 18, rar 109 : {C: 64.	smo_grp: OV DT on: entropy, 1 plit: 5, nam. nt_step: 0.024 } KNN ithm: ball_t: ights: unifor 15, random_st DT on: entropy, 1 split: 2, nam. NE, type: SM SVM 4.7606505362 e: 3.647528' shrinking: Tradom_state: 9 SVM 36757499625	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featte: DTC, random_state: 15029231026664, random SVMSMOTE ree, n_neighbors: 12, n m}, sub: {k_neighbors: 6} ate: 59, smo_grp: OVER, SMOTETomek max_depth: 13, max_featte: DTC, random_state: 7 OTETomek}} CondensedNearest Neighbour 1302, coef0: 0.451451925 799890116, kernel: rbf, na ne, tol: 0.08343157435387 no, smo_grp: UNDER, type ClusterCentroids 851, coef0: 0.2395774903	Over resampling res: sqrt, min.; 39}, sub: {k_r_state: 39, smo Over resampling resident in the state: 39, smo Over resampling res: type: SVMSM Combine resampling res: sqrt, min.; 9}, sub: {rander resampling symbol state: sqrt, min.; 9}, sub: {rander resampling res: SVM, probob 022}, sub: {n_robe: Condensed resampling resampling symbol state: sqrt, min.; 9} Under resampling 0858355, degree	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER, 0.9024 p: 13, ran- 3, out_step: OTE}} 0.9746 samples_leaf: om_state: 79, 0.9266 ee: 2, gamma: ability: False, neighbors: 16, NearestNeigh- 0.9403 ee: 2, gamma:
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3, min_sam_neighbtype: SVM TPE {classifier dom_state 0.1404242 TPE {classifier 19, min_s smo_grp: TPE {classifier scale, gam random_st n_seeds_S bour}} TPE {classifier scale, gam random_st n_seeds_S bour} TPE	ate: 36, 39 : {criteri imples_s ors: 2, or 4SMOTE 59 : {algori : 59, we 77752290 79 : {criteri amples_c or 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,	smo_grp: OV DT on: entropy, 1 plit: 5, nam at_step: 0.024 } KNN ithm: ball_t eights: unifor 5, random_st DT on: entropy, 1 split: 2, nam NE, type: SM SVM 4.7606505362 e: 3.6475528' shrinking: Tr adom_state: 9 SVM 36757499625 e: 4.6529048: 0, shrinking:	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featte: DTC, random_state: 15029231026664, random SVMSMOTE ree, n_neighbors: 12, n m}, sub: {k_neighbors: 6} ate: 59, smo_grp: OVER, SMOTETomek max_depth: 13, max_featte: DTC, random_state: 7 OTETomek}} CondensedNearest Neighbour 1302, coef0: 0.451451925 799890116, kernel: rbf, na ne, tol: 0.08343157435387 no, smo_grp: UNDER, type ClusterCentroids 851, coef0: 0.2395774903	Over resampling res: sqrt, min_gay}, sub: {k_1 state: 39, smo Over resampling resampling res: sqrt, min_game: KNN, m_neighbors: type: SVMSM: Combine resampling res: sqrt, min_gay}, sub: {rando} Under resampling 9778968, degree sVM, prob over resampling res: SVM, prob over condensed nes: SVM, prob over condensed nes: SVM, prob over resampling syrthesis over condensed nes: SVM, prob over condense nes: SVM, prob	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER, 0.9024 p: 13, ran- 3, out_step: OTE}} 0.9746 samples_leaf: om_state: 79, 0.9266 ne: 2, gamma: ability: False, neighbors: 16, NearestNeigh- 0.9403 ne: 2, gamma: ability: True, : {estimator:
3, min_sa m_neighbtype: SVM TPE {classifier dom_state 0.1404242 TPE {classifier 19, min_s smo_grp: TPE {classifier scale, gam random_sts bour}}	ate: 36, 39 : {criteri imples_s ors: 2, or 4SMOTE 59 : {algori : 59, we 77752290 79 : {criteri amples_c or 10, 10, 10, 10, 10, 10, 10, 10, 10, 10,	smo_grp: OV DT on: entropy, 1 plit: 5, nam at_step: 0.024 } KNN ithm: ball_t eights: unifor 5, random_st DT on: entropy, 1 split: 2, nam NE, type: SM SVM 4.7606505362 e: 3.6475528' shrinking: Tr adom_state: 9 SVM 36757499625 e: 4.6529048: 0, shrinking:	ER, type: BorderlineSMC SVMSMOTE max_depth: 10, max_featu e: DTC, random_state: :: 15029231026664, random SVMSMOTE ree, n_neighbors: 12, n m}, sub: {k_neighbors: 6 ate: 59, smo_grp: OVER, SMOTETomek max_depth: 13, max_featu e: DTC, random_state: 7 OTETomek} CondensedNearest Neighbour 1302, coef0: 0.451451925 799890116, kernel: rbf, na ne, tol: 0.08343157435387 n0, smo_grp: UNDER, type ClusterCentroids 851, coef0: 0.2395774903 58515328, kernel: rbf, na True, tol: 0.0840471776	Over resampling res: sqrt, min_gay}, sub: {k_1 state: 39, smo Over resampling resampling res: sqrt, min_game: KNN, m_neighbors: type: SVMSM: Combine resampling res: sqrt, min_gay}, sub: {rando} Under resampling 9778968, degree sVM, prob over resampling res: SVM, prob over condensed nes: SVM, prob over condensed nes: SVM, prob over resampling syrthesis over condensed nes: SVM, prob over condense nes: SVM, prob	neighbors: 8, 0.9532 samples_leaf: neighbors: 5, _grp: OVER, 0.9024 p: 13, ran- 3, out_step: OTE}} 0.9746 samples_leaf: om_state: 79, 0.9266 ne: 2, gamma: ability: False, neighbors: 16, NearestNeigh- 0.9403 ne: 2, gamma: ability: True, : {estimator:

TABLE S-35 "ECOLI4"

	Seed	Classifier	Resampler	Res.Group	GN
Grid	9	KNN	Instance	Under	0.940
~	1.0	****	HardnessThreshold	resampling	
Grid	18	KNN	Instance	Under	0.938
a · ·		TO D.	HardnessThreshold	resampling	0.000
Grid	27	KNN	Instance	Under	0.938
0.11	20	IZADY	HardnessThreshold	resampling	0.000
Grid	29	KNN	Instance	Under	0.938
~		*****	HardnessThreshold	resampling	
Grid	36	KNN	Instance	Under	0.938
G : 1	20	YOUY	HardnessThreshold	resampling	0.020
Grid	39	KNN	Instance	Under	0.938
Grid	59	KNN	HardnessThreshold	resampling	0.026
Gria	39	KININ	Instance HardnessThreshold	Under	0.936
Grid	79	KNN	Instance	resampling Under	0.938
Gila	19	MININ			0.936
Grid	90	KNN	HardnessThreshold Instance	resampling Under	0.96
GHU	90	WININ	Instance		0.90
Grid	109	KNN	HardnessThreshold Instance	resampling	0.020
GHU	109	WININ		Under	0.938
Random	9	SVM	HardnessThreshold SMOTEENN	resampling Combine	0.958
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True, random_state Random {classifier: weights: d UNDER, t Random {classifier: auto, gam ity: True, {n_neighb Neighbour Random {classifier: ay, weight type: Random {classifier: andom } {classifie	dom_stat : 27, sm 29 : {algoritistance} type: Co 36 : {C: 183 ma_valt randon ors: 18, rhoodCle 39 : {algoritists: unifor domUnd 59 : {C: 50. mma_valt randon ors: 13, randon	te: 27, shrino_grp: COM KNN thm: kd_tree, , sub: {n_neindensedNear} SVM 3.8498302401 te: 4.541580 n_state: 36, smo_grp: UN thm: ball_tre rm}, sub: {ra erSampler}} SVM 52254794958 ue: 4.794920 n_state: 59, smo_grp: UN	king: True, tol: 0.07556 BINE, type: SMOTEENN CondensedNearest Neighbour n_neighbors: 15, name: K ghbors: 6, n_seeds_S: 39, estNeighbourl) Neighbourhood CleaningRule 9255, coef0: -0.72349057 469874344, kernel: sigm shrinking: False, tol: 0 NDER, threshold_cleaning RandomUnderSampler e, n_neighbors: 10, name ndom_state: 39, replacemendom_state: 39, replacemendom_cleaningRule Neighbourhood CleaningRule Neighbourhood CleaningRule Neighbourhood CleaningRule 1245, coef0: -0.29371673 1228915915, kernel: sigm shrinking: True, tol: 0.0	Under resampling	0.956 0.956
True, random_state Random {classifier. weights: d UNDER, r Random {classifier. d classifier. d cla	dom_stat: 27, sm 29 : {algoritistance} type: Co 36 : {C: 183 tma_valutandom ors: 18, choodCle 39 : {algoritistance} : {algoritistance} : {c: 183 tma_valutandom ors: 18, choodCle 39 : {algoritistance} : {c: 50. tma_valutance} : {c: 5	te: 27, shrino grp: COM KNN thm: kd_tree, sub: {n_nei ondensedNear SVM} 3.8498302401 a: 4.541580 smo_grp: UNeaningRule}} KNN thm: ball_tre trm}, sub: {ra erSampler} SVM 52254794958 ue: 4.79492C m_state: 59, smo_grp: UNeaningRule}}	king: True, tol: 0.07556 BINE, type: SMOTEENN CondensedNearest Neighbour n_neighbors: 15, name: K ghbors: 6, n_seeds_S: 39, estNeighbour/hood CleaningRule 9255, coef0: -0.72349057 469874344, kernel: sigm shrinking: False, tol: 0 NDER, threshold_cleaning RandomUnderSampler e, n_neighbors: 10, name ndom_state: 39, replacemendom_state: 39, replacemendom_state: 39, replacemendom_state: 31245, coef0: -0.29371673 2228915915, kernel: sigm shrinking: True, tol: 0.00 NDER, threshold_cleaning	6636818736552} } Under resampling Under resampling INN, p: 18, rands, random_state: Under resampling 95483935, degreoid, name: SV	0.956 0.956
True, random_state Random {classifier: weights: d UNDER, t Random {classifier: auto, gam ity: True, {n neighb Neighbour Random {classifier: 39, weight type: Rand Random {classifier: scale, gan ity: False {n_neighb Neighbour Random {classifier: scale, gan ity: False Random Random	dom_stat: 27, sm 29 : {algoritistance} type: Co 36 : {C: 183 tma_valutrandon tors: 18, thoodCle 39 : {algoritistance} type: Co 36 : {C: 50. thoodCle 79	te: 27, shrino _grp: COM KNN thm: kd_tree, , sub: {n_neindensedNear SVM 3.8498302401 te: 4.541580 n_state: 36, smo_grp: UN thm: ball_treerm}, sub: {raerSampler}} SVM 52254794958 te: 4.794920 n_state: 59, smo_grp: UN tenningRule}} KNN	king: True, tol: 0.07556 BINE, type: SMOTEENN CondensedNearest Neighbour n_neighbors: 15, name: K ghbors: 6, n_seeds_S: 39, estNeighbour/hood CleaningRule 9255, coef0: -0.72349057 469874344, kernel: sigm shrinking: False, tol: 0 NDER, threshold_cleaning RandomUnderSampler e, n_neighbors: 10, name ndom_state: 39, replacemendom_state: 39, replacemendom_state: 39, replacemendom_state: 31245, coef0: -0.29371673 2228915915, kernel: sigm shrinking: True, tol: 0.00 NDER, threshold_cleaning	G636818736552} Under resampling INN, p: 18, randor, random_state: Under resampling 95483935, degree 00479117215709 0.24260160255 Under resampling KNN, p: 14, rent: True, smo_gent Under resampling	0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956
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True, random_state Random {classifier. weights: d UNDER, t Random {classifier. auto, gam ity: True, {f_neighb Neighbour Random {classifier. 39, weight type: Rand Random {classifier. scale, gam ity: False. {f_neighb Neighbour Random {classifier. scale, gam ity: False. {f_neighb Neighbour Random {classifier. scale, gam ity: False. {f_neighb Neighbour Random	dom_stat: 27, sm 29 : {algoritistance} type: Co 36 : {C: 183: ma_valu randon ors: 18, choodCle 39 : {algoritistance} type: Co 36 : {C: 50. nma_val randon ors: 13, choodCle 79 : {algoritistandon ors: 13, choodCle 79 : {algoritistandon ors: 13, choodCle 79 : {algoritistandon ors: 13, choodCle 79 : {algoritiniform}	te: 27, shrino _grp: COM KNN khm: kd_tree, , sub: {n_neindensedNear SVM} 3.8498302401 ae: 4.541580 n_state: 36, smo_grp: UN aningRule}} KNN khm: ball_treerm}, sub: {raerSampler}} SVM 52254794958 ue: 4.794920 n_state: 59, smo_grp: UN aningRule} KNN khm: brute, n	king: True, tol: 0.07556 BINE, type: SMOTEENN CondensedNearest Neighbour n_neighbors: 15, name: K ghbors: 6, n_seeds_S: 39, estNeighbour} Neighbourhood CleaningRule 9255, coef0: -0.72349057 469874344, kernel: sigm shrinking: False, tol: 0 NDER, threshold_cleaning RandomUnderSampler Neighbourhood CleaningRule 100, name ndom_state: 39, replacement Neighbourhood CleaningRule 10245, coef0: -0.29371673 10228915915, kernel: sigm shrinking: True, tol: 0.0 NDER, threshold_cleaning RandomUnderSampler RandomUnderSampler	Under resampling	0.956 0.950 0.950 0.950 0.950 0.950 0.950 0.950 0.950 0.950 0.950 0.950 0.950 0.950 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956 0.956

continued on the next column

TABLE S-35 "ECOLI4" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	KNN	RandomUnderSampler	Under	0.930
				resampling	
			n_neighbors: 14, name:		
			ndom_state: 90, replaceme	nt: True, smo_	grp: UNDER
		erSampler}}			
Random	109	SVM	SMOTEENN	Combine	0.971
(1 :0	(0.	120 57202156		resampling	L
			711913, coef0: -0.08970		
			339745368236571, kernel:		
), shrinking: False, tol: 0.0		190218}, suc
TPE	9	SVM	COMBINE, type: SMOTE ClusterCentroids	Under	0.96
IFE	"	3 V IVI	ClusterCellifolds	resampling	0.90
Lelaccifier	. (C: 144	 	1 4458, coef0: 0.0827986508		99: 3 gamma
			36312238, kernel: sigmoi		
			g: False, tol: 0.0111821853		
			grp: UNDER, type: Clust		
TPE	18	KNN	CondensedNearest	Under	0.960
	10		Neighbour	resampling	0.700
{classifier	: {algori	thm: brute. n	_neighbors: 25, name: Kl		om state: 18
			ghbors: 8, n_seeds_S: 18,		
			estNeighbour}}		31
TPE	27	SVM	ClusterCentroids	Under	0.965
				resampling	
			0854, coef0: 0.297259838	5045751, degre	
scale, gam	ıma_valı	ie: 7.0867680	991152495, kernel: sigmo	id, name: SVN	I, probability
True, rand	dom_stat	e: 27, shrinki	ing: True, tol: 0.0974590	7720648339},	sub: {estima
tor: MiniB	BatchKM	Ieans, random	_state: 27, smo_grp: UNI	DER, type: Clus	sterCentroids
voting: so	ft}}				
TPE	29	SVM	ClusterCentroids	Under	0.985
				resampling	
			3951, coef0: 0.1165418391		
auto, gam	ma_valu	ie: 7.4252205	34069753, kernel: sigmoi	d, name: SVM	l, probability
auto, gam False, ran	ma_valu dom_sta	ie: 7.4252205 te: 29, shrink	34069753, kernel: sigmoi ing: True, tol: 0.0975043	d, name: SVM 6868193445},	l, probability sub: {estima
auto, gam False, rand tor: MiniB	ma_valu dom_sta BatchKM	ie: 7.4252205 te: 29, shrink	34069753, kernel: sigmoi	d, name: SVM 6868193445},	l, probability sub: {estima
auto, gam False, rand tor: MiniB voting: sol	ma_valu dom_sta BatchKM ft}}	te: 7.4252205 te: 29, shrink Ieans, random	34069753, kernel: sigmoing: True, tol: 0.09750436 state: 29, smo_grp: UND	d, name: SVM 6868193445}, DER, type: Clu	I, probability sub: {estima sterCentroids
auto, gam False, rand tor: MiniB	ma_valu dom_sta BatchKM	ie: 7.4252205 te: 29, shrink	34069753, kernel: sigmoiing: True, tol: 0.09750430_state: 29, smo_grp: UNE	d, name: SVM 6868193445}, DER, type: Clus	I, probability sub: {estima sterCentroids
auto, gam False, rand tor: MiniB voting: sol TPE	ma_valu dom_sta BatchKM ft}}	te: 7.4252205 te: 29, shrink leans, random	34069753, kernel: sigmoi ing: True, tol: 0.0975043 _state: 29, smo_grp: UNL CondensedNearest Neighbour	d, name: SVM 6868193445}, DER, type: Clus Under resampling	I, probability sub: {estima sterCentroids
auto, gam False, rand tor: MiniE voting: sof TPE {classifier:	ma_valudom_sta BatchKM ft}} 36 : {algori	te: 7.4252205 te: 29, shrink Ieans, random KNN tthm: brute, n	34069753, kernel: sigmoiing: True, tol: 0.09750430 _state: 29, smo_grp: UNL CondensedNearest Neighbour _neighbors: 20, name: K1	d, name: SVM 6868193445}, DER, type: Clus Under resampling NN, p: 2, rando	f, probability sub: {estima sterCentroids 0.973 om_state: 36
auto, gam False, rand tor: MiniB voting: sof TPE {classifier: weights: u	ma_valu dom_sta BatchKM ft}} 36 : {algori iniform}	te: 7.4252205 te: 29, shrink Ieans, random KNN ithm: brute, n , sub: {n_neig	34069753, kernel: sigmoing: True, tol: 0.09750430_state: 29, smo_grp: UNL CondensedNearest Neighbour _neighbors: 20, name: Kithbors: 48, n_seeds_S: 32,	d, name: SVM 6868193445}, DER, type: Clus Under resampling NN, p: 2, rando	f, probability sub: {estima sterCentroids 0.973 om_state: 36
auto, gam False, rand tor: MiniB voting: sof TPE {classifier: weights: u UNDER, t	ma_valu dom_sta BatchKM ft}} 36 : {algori uniform} type: Co	te: 7.4252205 te: 29, shrink Ieans, random KNN ithm: brute, n , sub: {n_neig andensedNeare	34069753, kernel: sigmoing: True, tol: 0.0975043 _state: 29, smo_grp: UNE CondensedNearest Neighbour _neighbors: 20, name: K1; thbors: 48, n_seeds_S: 32, estNeighbour}	d, name: SVM 6868193445}, DER, type: Clu- Under resampling NN, p: 2, rand- random_state:	d, probability sub: {estima sterCentroids
auto, gam False, rand tor: MiniB voting: sof TPE {classifier: weights: u	ma_valu dom_sta BatchKM ft}} 36 : {algori iniform}	te: 7.4252205 te: 29, shrink Ieans, random KNN ithm: brute, n , sub: {n_neig	34069753, kernel: sigmoing: True, tol: 0.0975043i _state: 29, smo_grp: UNE CondensedNearest Neighbour _neighbors: 20, name: K1 khbors: 48, n_seeds_S: 32, estNeighbour} CondensedNearest	d, name: SVM 6868193445}, DER, type: Clus Under resampling NN, p: 2, rand- random_state:	d, probability sub: {estima sterCentroids
auto, gam False, rand tor: MiniB voting: sol TPE {classifier: weights: u UNDER, t	ma_valudom_sta BatchKM ftt} 36 : {algoriniform} type: Co	e: 7.4252205 te: 29, shrink leans, random KNN ithm: brute, n , sub: {n_neig} indensedNeare KNN	34069753, kernel: sigmoing: True, tol: 0.0975043ing: True, tol: 0.097504ing: True, tol: 0.097504	d, name: SVM 6868193445}, DER, type: Clu: Under resampling NN, p: 2, rand- random_state: Under resampling	f, probability sub: {estima sterCentroids} 0.973 0.973 om_state: 36 36, smo_grp
auto, gam False, rand tor: MiniE voting: sof TPE {classifier: weights: u UNDER, t TPE {classifier:	ma_valudom_sta BatchKM fft} 36 : {algori niform} type: Co 39 : {algori	e: 7.4252205 te: 29, shrink Ieans, random KNN thm: brute, n, sub: {n_neig} ondensedNeare KNN thm: ball_tree	34069753, kernel: sigmoing: True, tol: 0.0975043i_state: 29, smo_grp: UNL CondensedNearest Neighbour _neighbors: 20, name: Kl thors: 48, n_seeds_S: 32, the state of the stat	d, name: SVM 6868193445}, DER, type: Clu: Under resampling NN, p: 2, rand- random_state: Under resampling NN, p: 9, rand	0.973 0.973 0.98 0.98 0.98
auto, gam False, rand tor: MiniB voting: sof TPE {classifier: weights: u UNDER, t TPE {classifier: weights: u	ma_valudom_sta BatchKM ft}} 36 : {algoriuniform} type: Co 39 : {algoriuniform}	e: 7.4252205 te: 29, shrink leans, random KNN thm: brute, n, sub: {n_neig} indensedNeare KNN thm: ball_tree , sub: {n_neig}	34069753, kernel: sigmoing: True, tol: 0.0975043(_state: 29, smo_grp: UNL CondensedNearest Neighbour _neighbors: 20, name: Kithbors: 48, n_seeds_S: 32, stNeighbour} CondensedNearest Neighbour} CondensedNearest Neighbors: 12, name: Kithbors: 43, n_seeds_S: 34,	d, name: SVM 6868193445}, DER, type: Clu: Under resampling NN, p: 2, rand- random_state: Under resampling NN, p: 9, rand	0.973 0.973 0.98 0.98 0.98
auto, gam False, rand tor: MiniB voting: sol TPE {classifier: weights: u UNDER, t {classifier: weights: u UNDER, t	ma_valudom_sta BatchKM ft}} 36 : {algori iniform} type: Co 39 : {algori iniform} type: Co	e: 7.4252205 te: 29, shrink leans, random KNN tthm: brute, n, sub: {n_neig} indensedNeare KNN thm: ball_tree , sub: {n_neig} indensedNeare knn	34069753, kernel: sigmoing: True, tol: 0.0975043i_state: 29, smo_grp: UNE CondensedNearest Neighbour _neighbors: 20, name: K! thbors: 48, n_seeds_S: 32, stNeighbour} CondensedNearest Neighbour , n_neighbors: 12, name: K; thbors: 43, n_seeds_S: 34, estNeighbour}	d, name: SVM 6868193445}, DER, type: Clu- Under resampling NN, p: 2, rand- random_state: Under resampling KNN, p: 9, rand- random_state:	0.973 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98
auto, gam False, rand tor: MiniB voting: sol TPE {classifier: weights: u UNDER, t {classifier: weights: u UNDER, t	ma_valudom_sta BatchKM ft}} 36 : {algoriuniform} type: Co 39 : {algoriuniform}	e: 7.4252205 te: 29, shrink leans, random KNN thm: brute, n, sub: {n_neig} indensedNeare KNN thm: ball_tree , sub: {n_neig}	34069753, kernel: sigmoing: True, tol: 0.0975043i_state: 29, smo_grp: UNE CondensedNearest Neighbour _neighbors: 20, name: K1; kbors: 48, n_seeds_S: 32, estNeighbour} CondensedNearest Neighbour , n_neighbors: 12, name: K2; estNeighbour: 43, n_seeds_S: 34, estNeighbour} CondensedNearest Neighbour: 43, n_seeds_S: 34, estNeighbour}	d, name: SVM 6868193445}, DER, type: Clu- Under resampling NN, p: 2, rand- random_state: Under resampling CNN, p: 9, rand- random_state: Under	0.973 0.98 0.98 0.98 0.98 0.98 0.98 0.98 0.98
auto, gam False, randor: MiniB voting: soi TPE {classifier: weights: u UNDER, t TPE {classifier: weights: u UNDER, t TPE	ma_valudom_sta BatchKM ft} 36 : {algori iniform} type: Co 39 : {algori iniform} type: Co 59	e: 7.4252205 te: 29, shrink Ieans, random KNN thm: brute, n, sub: {n_neigondensedNeare} KNN thm: ball_tree, sub: {n_neigondensedNeare} KNN	34069753, kernel: sigmoing: True, tol: 0.0975043i_state: 29, smo_grp: UNL CondensedNearest Neighbour _neighbors: 20, name: Kl thors: 48, n_seeds_S: 32, estNeighbour} CondensedNearest Neighbour , n_neighbors: 12, name: Kl thors: 43, n_seeds_S: 34, estNeighbour} CondensedNearest Neighbour} CondensedNearest Neighbour} CondensedNearest Neighbour	d, name: SVM 6868193445}, DER, type: Clu: Under resampling NN, p: 2, rand- random_state: Under resampling NN, p: 9, rand- random_state: Under resampling	0.973 0.973 0.973 om_state: 36 36, smo_grp 0.98 lom_state: 39 39, smo_grp 0.980
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auto, gam False, ranetor: MiniB voting: sol TPE {classifier: weights: u UNDER, 1 TPE {classifier: uNDER, 1 TPE {classifier: uNDER, 1 TPE {classifier: gamma: s probability n_neights TPE {classifier: gamma: s probability n_neight TPE {classifier: gomma: s probability n_neight TPE }	ma_valudom_sta BatchKM ft} 36 : {algori inform} type: Co 39 : {algori type: Co 59 : {algori type: Co cale, ga y: True, i oors: 4, r 90 : {algori type: Co	e: 7.4252205 te: 29, shrink leans, random KNN thm: brute, n, sub: {n_neig} indensedNeare KNN thm: ball_tree, sub: {n_neig} indensedNeare KNN thm: kd_tree, sub: {n_neig} indensedNeare KNN 119.38348082 mma_value: random_state: andom_state: andom_state: kNN ithm: kd_tree, rm}, sub: {est}	34069753, kernel: sigmoing: True, tol: 0.0975043i_state: 29, smo_grp: UNE CondensedNearest Neighbour _neighbors: 20, name: K! shbors: 48, n_seeds_S: 32, estNeighbour} CondensedNearest Neighbour} CondensedNearest Neighbors: 12, name: K! shbors: 43, n_seeds_S: 34, estNeighbour} CondensedNearest Neighbour n_neighbors: 20, name: K! shbors: 38, n_seeds_S: 25, estNeighbour n_neighbors: 20, name: K! shbors: 38, n_seeds_S: 25, estNeighbour 1.1204226930201462, ker 79, shrinking: False, tol: 0 79, smo_grp: OVER, type ClusterCentroids n_neighbors: 12, name: imator: KMeans, random_githers.	d, name: SVM 6868193445}, DER, type: Clui Under resampling NN, p: 2, rand- random_state: Under resampling CNN, p: 9, rand- random_state: Under resampling NN, p: 4, rand- random_state: Under resampling NN, p: 4, rand- random_state: Over resampling 1491888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 1918888299824 19188888299824 19188888889 19188888888888888888888888	0.973 0.980 0.981 0.980 0.981 0.980 0.981 0.980 0.981 0.980 0.981 0.980 0.981 0.980 0.981 0.980 0.991
auto, gam False, ran- tor: MiniB voting: soi TPE {classifier: weights: u UNDER, t TPE {classifier: weights: u UNDER, t TPE {classifier: gamma: s probability {n_neight} TPE {classifier: gamma: s queries	ma_valudom_sta dom_sta satchKM ft} 36 : {algori iniform} type: Co 39 : {algori iniform} type: Co 59 : {algori iniform} type: Co 79 : {C: cale, ga y: True, 1 oors: 4, r 90 : {algori iniform}	e: 7.4252205 te: 29, shrink leans, random KNN thm: brute, n , sub: {n_neig} ondensedNeare KNN thm: ball_tree , sub: {n_neig} ondensedNeare KNN thm: kd_tree , sub: {n_neig} ondensedNeare SVM 119.38348082 mma_value: random_state: andom_state: andom_state: thm: kd_tree , sub: {n_neig} ondensedNeare sub: {n_neig} ondensedNeare SVM	34069753, kernel: sigmoing: True, tol: 0.0975043i_state: 29, smo_grp: UNE CondensedNearest Neighbour _neighbors: 20, name: K! thbors: 48, n_seeds_S: 32, estNeighbour} CondensedNearest Neighbour; _n_neighbors: 12, name: K! thbors: 43, n_seeds_S: 34, estNeighbour} CondensedNearest Neighbour; _n_neighbors: 20, name: K! thbors: 38, n_seeds_S: 34, estNeighbour n_neighbors: 20, name: K! thbors: 38, n_seeds_S: 25, estNeighbour} ADASYN 203808, coef0: -0.20037 1.1204226930201462, ker 79, shrinking: False, tol: 0 79, smo_grp: OVER, type ClusterCentroids _n_neighbors: 12, name: imator: KMeans, random_shard};	d, name: SVM 6868193445}, DER, type: Clu Under resampling NN, p: 2, rand random_state: Under resampling CNN, p: 9, rand random_state: Under resampling LNN, p: 4, rand random_state: Over resampling 1491888299824 rnel: sigmoid, 0.084476856529 :: ADASYN}} Under resampling KNN, p: 19, 1 state: 90, smo_j	0.973: 0.980: 0.980: 0.980: 0.980: 0.980: 0.981: 0.980: 0.981: 0.981: 0.982: 0.982: 0.986: 0.
auto, gam False, ranctor: MiniB Voting: soi TPE {classifier: weights: u UNDER, t TPE {classifier: weights: u UNDER, t TPE {classifier: weights: u UNDER, t TPE {classifier: gamma: s probability {n_neighb TPE {classifier: gomma: s probability fn_neighb TPE {classifier: gomma: s probability fn_neighb TPE {classifier: gom, weight type: Clus TPE	ma_valudom_sta dom_sta	e: 7.4252205 te: 29, shrink leans, random KNN thm: brute, n , sub: {n_neig} indensedNeare KNN thm: ball_tree , sub: {n_neig} indensedNeare KNN thm: kd_tree, , sub: {n_neig} indensedNeare KNN thm: kd_tree, , sub: {n_neig} indensedNeare KNN thm: kd_tree, sub: {n_neig} indensedNeare SVM 119.38348082 indensedNeare SVM ithm: kd_tree, ithm:	34069753, kernel: sigmoing: True, tol: 0.0975043i_state: 29, smo_grp: UNE CondensedNearest Neighbour _neighbors: 20, name: K! thbors: 48, n_seeds_S: 32, estNeighbour} CondensedNearest Neighbour; _n_neighbors: 12, name: K! thbors: 43, n_seeds_S: 34, estNeighbour} CondensedNearest Neighbour; _n_neighbors: 20, name: K! thbors: 38, n_seeds_S: 34, estNeighbour n_neighbors: 20, name: K! thbors: 38, n_seeds_S: 25, estNeighbour} ADASYN 203808, coef0: -0.20037 1.1204226930201462, ker 79, shrinking: False, tol: 0 79, smo_grp: OVER, type ClusterCentroids _n_neighbors: 12, name: imator: KMeans, random_shard};	d, name: SVM 6868193445}, DER, type: Clue Under resampling NN, p: 2, rand- random_state: Under resampling CNN, p: 9, rand- random_state: Under resampling NN, p: 4, rand- random_state: Over resampling 491888299824 rel: sigmoid, 0.084476856529 :: ADASYN}} Under resampling KNN, p: 19, 1 state: 90, smo_ Combine resampling	0.973 0.973 0.973 0.973 0.973 0.980 0.980 0.980 0.980 0.971 0.971 0.962 0.962 0.962 0.980
auto, gam False, ran- tor: MiniB voting: soi TPE {classifier: weights: u UNDER, t TPE {classifier: weights: u UNDER, t TPE {classifier: gamma: s probability {n_neight} TPE {classifier: gamma: s gamma: s quantification the field of the field	ma_valudom_sta dom_sta	e: 7.4252205 te: 29, shrink leans, random KNN thm: brute, n , sub: {n_neig} ondensedNeare KNN thm: ball_tree , sub: {n_neig} ondensedNeare KNN thm: kd_tree, , sub: {n_neig} ondensedNeare KNN thm: kd_tree, , sub: {n_neig} ondensedNeare SVM 119.38348082 mma_value: random_state: KNN ithm: kd_tree,	34069753, kernel: sigmoing: True, tol: 0.0975043i_state: 29, smo_grp: UNE CondensedNearest Neighbour _neighbors: 20, name: K! thbors: 48, n_seeds_S: 32, stNeighbour} CondensedNearest Neighbour} CondensedNearest Neighbour; n_neighbors: 12, name: K! thbors: 43, n_seeds_S: 34, stNeighbour} CondensedNearest Neighbour} CondensedNearest Neighbour} An_seeds_S: 34, stNeighbour] CondensedNearest Neighbour] ADASYN 203808, coef0: -0.20037 1.1204226930201462, ker 79, shrinking: False, tol: 0 79, smo_grp: OVER, type ClusterCentroids n_neighbors: 12, name: imator: KMeans, random_ghard} SMOTEENN	d, name: SVM 6868193445}, DER, type: Clu- 6868193445}, DER, type: Clu- Under resampling NN, p: 2, rand- random_state: Under resampling CNN, p: 9, rand random_state: Under resampling NN, p: 4, rand random_state: Over resampling 491888299824 nel: sigmoid, 0.084476856529 :: ADASYN}} Under resampling KNN, p: 19, 1 state: 90, smo_ Combine resampling 0023311, degraid, name: SVM	0.973: 0.980: 0.971: 0.971: 0.971: 0.971: 0.971: 0.971: 0.962: 0.962: 0.982: 0.982: 0.983: 0.988: 0.980: 0.971: 0.

TABLE S-36 "PAGE-BLOCKS-1-3_VS_4"

TABLE S-36 "PAGE-BLOCKS-1-3_VS_4" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM	Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	RF	OneSidedSelection	Under	0.9907	Random	90	DT	SVMSMOTE	Over	0.9791
Cit	10	DE	CondonedNone	resampling	0.9859					resampling	
Grid	18	RF	CondensedNearest Neighbour	Under resampling	0.9859				ix_depth: 13, max_fea		
Grid	27	RF	CondensedNearest	Under	0.9895				me: DTC, random_stat		
	ļ -·		Neighbour	resampling		type: SVN			01857565396289, rando	om_state: 90, sm	io_gip: Ovek,
Grid	29	RF	CondensedNearest	Under	0.9871	Random	109	DT	OneSidedSelection	Under	0.9989
			Neighbour	resampling		Kandom	107	101	Olicoldedociection	resampling	0.5505
Grid	36	RF	CondensedNearest	Under	0.9919	{classifier	: {criter	ion: entropy, i	nax_depth: 7, max_feat		_samples_leaf:
Grid	39	RF	Neighbour CondensedNearest	resampling Under	0.9896				ne: DTC, random_state		
Onu	39	KI	Neighbour	resampling	0.9690				09, smo_grp: UNDER,	* *	
Grid	59	RF	CondensedNearest	Under	0.9834	TPE	9	RF	SVMSMOTE	Over	0.9919
			Neighbour	resampling		(alassifian	u (lhoota	tuomi Turio oli	 ass_weight: balanced, c	resampling	many footsman
Grid	79	DT	CondensedNearest	Under	0.9931				_samples_split: 7, n_e		
0:1	00	DT	Neighbour	resampling	0.0024				rs: 2, m_neighbors: 4, or		
Grid	90	DT	CondensedNearest Neighbour	Under resampling	0.9824				ER, type: SVMSMOTE		,
Grid	109	RF	CondensedNearest	Under	0.9907	TPE	18	RF	CondensedNearest	Under	0.9954
			Neighbour	resampling			<u> </u>		Neighbour	resampling	
Random	9	RF	OneSidedSelection	Under	0.9895				class_weight: None, cr		
				resampling					_samples_split: 9, n_e		
			ass_weight: balanced,						bors: 5, n_seeds_S: 3: estNeighbour}}	i, random_state:	18, smo_grp:
			_samples_split: 14, n			TPE	27	DT	SVMSMOTE	Over	0.9943
		ıb: {n_neign ieSidedSelect	bors: 7, n_seeds_S:	15, random_sta	ate: 9, smo_grp:	II L	-	101	SYMSWOTE	resampling	0.5543
Random	18	RF	OneSidedSelection	Under	0.9896	{classifier	: {criter	ion: gini, ma	x_depth: 14, max_feat		_samples_leaf:
random	10	TG.	Onesidedselection	resampling	0.5050	19, min_s	samples_	split: 16, na	me: DTC, random_stat	e: 27}, sub: {k	_neighbors: 7,
{classifier	: {boots	trap: True, o	lass_weight: balanced		ni, max_features:				553819045852984, rand	om_state: 27, sm	io_grp: OVER,
			in_samples_split: 8, n			type: SVN		,,			
_	, ,	. – .	bors: 3, n_seeds_S:	15, random_sta	te: 18, smo_grp:	TPE	29	KNN	RandomOverSampler		0.9784
		eSidedSelect				Classifier	: Jalgori	thm: ball tree	, n neighbors: 5, name	resampling	dom state: 20
Random	27	RF	ClusterCentroids	Under	0.9822				m_state: 29, smo_grp: (
Lelassifier	. Shootet	tran: False cl	ass_weight: balanced,	resampling	ny may features:	pler}}	anstance j	, suo. (rundo	m_state. 25, smo_grp. v	5 (Ert, type: Run	idomo verbam
			samples_split: 9, n_e			TPE	36	RF	OneSidedSelection	Under	0.9977
dom_state	e: 27}, su	ib: {estimator	: KMeans, random_sta	ate: 27, smo_gr	p: UNDER, type:					resampling	
		voting: soft}}							class_weight: balance		
Random	29	RF	OneSidedSelection	Under	0.9811				leaf: 5, min_samples_sp		
(1 'C	<u> </u>	F.1 1		resampling					{n_neighbors: 6, n_se dedSelection}}	eus_s: 11, ranc	ioni_state: 50,
			ass_weight: balanced, in_samples_split: 4, n			TPE	39	RF	CondensedNearest	Under	0.9931
			nbors: 6, n_seeds_S:						Neighbour	resampling	
		eSidedSelect		, random_sta	ic. 25, smo_grp.	{classifier	: {boot	strap: False,	class_weight: balance	ed_subsample, o	criterion: gini,
Random	36	DT	CondensedNearest	Under	0.9932				es_leaf: 1, min_sample		
			Neighbour	resampling					sub: {n_neighbors: 20,		random_state:
			max_depth: 19, max_f						ondensedNearestNeighb		0.0010
			ne: DTC, random_sta			TPE	59	RF	SVMSMOTE	Over resampling	0.9919
	5: 38, ra	ndom_state: .	36, smo_grp: UNDER	, type: Condens	sedNearestNeigh-	{classifier	" {boot	strap: True	class_weight: balance		riterion: gini
bour}} Random	39	RF	SVMSMOTE	Over	0.9883				es_leaf: 1, min_sample		
Random	37	IXI	SYMSMOTE	resampling	0.7003				, sub: {k_neighbors:		
{classifier	: {boots	trap: True,	class_weight: balanced		riterion: entropy,				n_state: 59, smo_grp: 0		
max_featu	ires: log	2, min_samp	les_leaf: 1, min_samp	oles_split: 16,	n_estimators: 11,	TPE	79	RF	CondensedNearest	Under	0.9954
			, sub: {k_neighbors:			(1 :0	(1 ,	F 1	Neighbour	resampling	l
			tate: 39, smo_grp: OV						class_weight: balanced les_leaf: 4, min_sampl		
Random	59	RF	SVMSMOTE	Over	0.9859				ub: {n_neighbors: 7, n_		
{claccifier	· {boots	tran: True	class_weight: balanced	resampling	riterion: entropy				ensedNearestNeighbour		
			les_leaf: 2, min_sam			TPE	90	KNN	SMOTE	Over	0.9871
			, sub: {k_neighbors:							resampling	
			state: 59, smo_grp: O						_neighbors: 3, name:		
Random	79	RF	OneSidedSelection	Under	0.9896			, sub: {k_ne	ighbors: 6, random_sta	te: 90, smo_grp:	: OVER, type:
	L			resampling		SMOTE}	,	DT	00:4.40.1:	TTd	1.0
			ass_weight: balanced,			TPE	109	DT	OneSidedSelection	Under	1.0
			in_samples_split: 4, n			{classifier	- {criteri	on: entropy r	 nax_depth: 11, max_fea	resampling	samples leaf
		ub: {n_neigh ieSidedSelect	bors: 18, n_seeds_S:	ı∠, random_sta	ite: /9, smo_grp:				: DTC, random_state:		
ONDER,	type. Of	icolucuotice!		ontinued on t	he next column				09, smo_grp: UNDER,		
			C	ommueu on t	не нем сошин		٠, - ١٠		,	,,	

TABLE S-37 "ABALONE9-18" – CONTINUED FROM PREVIOUS COLUMN

TABLE S-37 "ABALONE9-18"

Grid	Seed	Classifier	Resampler	Res.Group	GM
Ond	9	LR	RandomOverSampler	Over	0.8608
0:1	10	1.0	D 1 0 0 1	resampling	0.0406
Grid	18	LR	RandomOverSampler	Over	0.8486
C.: 1	27	T.D.	CMOTENIC	resampling	0.0404
Grid	27	LR	SMOTENC	Over	0.8494
Grid	29	LR	SMOTENC	resampling Over	0.8494
Giiu	29	LK	SMOTENC	resampling	0.0494
Grid	36	LR	RandomOverSampler	Over	0.8594
Onu	50	Lit	randomo versampier	resampling	0.0571
Grid	39	LR	SMOTE	Over	0.8516
				resampling	
Grid	59	LR	RandomOverSampler	Over	0.8559
			•	resampling	
Grid	79	LR	SMOTENC	Over	0.8509
				resampling	
Grid	90	LR	RandomOverSampler	Over	0.8538
				resampling	
Grid	109	LR	RandomOverSampler	Over	0.856
				resampling	
Random	9	SVM	ADASYN	Over	0.8854
(1 :0	(0.50	(455(212:::		resampling	L
			606, coef0: 0.404805985		
			9053920426, kernel: lin		
			shrinking: False, tol: (314136}, sub:
			9, smo_grp: OVER, type		
Random	18	SVM	SMOTETomek	Combine	0.8719
(1	(0.5-	007/00/17	100 00 0 10=1=5	resampling	L
			409, coef0: 0.407178093		
			4885457997, kernel: line		
			king: False, tol: 0.0824		3}, sub: {ran-
			BINE, type: SMOTETom		
Random	27	LR	SMOTENC	Over	0.8693
				resampling	
			57984, 11_ratio: 0.7048		
nenalty so	olver: no	ne+lbfgs, ran	dom_state: 27, tol: 0.048		
egorical_f	eatures:	True, k_neig	hbors: 1, random_state:	27, smo_grp:	OVER, type:
egorical_f SMOTEN	eatures: C}}	. – •			
egorical_f	eatures:	True, k_neig	shors: 1, random_state:	Over	OVER, type: 0.871
egorical_f SMOTEN Random	eatures: C}} 29	LR	SMOTE	Over resampling	0.871
egorical_fi SMOTEN Random	eatures: C}} 29 : {C: 2	LR 3.0082233097	SMOTE 745926, 11_ratio: 0.3154	Over resampling	0.871 5, name: LR,
egorical_fi SMOTEN Random {classifier penalty_so	eatures: C}} 29 : {C: 2	LR 3.0082233097 one+lbfgs, ra	SMOTE 745926, 11_ratio: 0.3154 ndom_state: 29, tol: 0.	Over resampling 1920212013031 025462746291-	0.871 5, name: LR,
egorical_fi SMOTEN Random {classifier penalty_sc {k_neighb	eatures: C}} 29 : {C: 2 olver: no oors: 7, r	LR 3.0082233097 one+lbfgs, ra andom_state:	SMOTE 745926, 11_ratio: 0.3154 ndom_state: 29, tol: 0. 29, smo_grp: OVER, typ	Over resampling 1920212013031 025462746291 be: SMOTE}}	0.871 5, name: LR, 494042}, sub:
egorical_fi SMOTEN Random {classifier penalty_so	eatures: C}} 29 : {C: 2	LR 3.0082233097 one+lbfgs, ra	SMOTE 745926, 11_ratio: 0.3154 ndom_state: 29, tol: 0.	Over resampling 1920212013031 025462746291-be: SMOTE}	0.871 5, name: LR, 494042}, sub:
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egorical_f SMOTEN Random {classifier penalty_sc{k_neighb} Random {classifier auto, gam False, ran egorical_f SMOTEN Random {classifier penalty_sc dom_state Random {classifier value, gan ity: True, {k_neighb} Random	eatures: C}} 29 : {C: 29 : {C: 29 : {C: 40. ma_valudom_sta eatures: C}} 39 : {C: 50. in {C: 65. mma_valurandom_sta eatures: C} : {C: 65. mma_valurandom_sta eatures: C} : {C: 65. mma_valurandom_sta eatures: C} : {C: 65.	LR 3.008223309' one+lbfgs, ra andom_state:	SMOTE 45926, 11_ratio: 0.3154 100m_state: 29, tol: 0. 29, smo_grp: OVER, tyl SMOTENC	Over resampling 1920212013031 025462746291- be: SMOTE}} Over resampling 215419573, deg ar, name: SVN 919385163351 36, smo_grp: Combine resampling 194951035666 141923 ek}} Over resampling 19577565, degree 1957756565, degree 1957756565, degree 1957756565, degree 1957756565, degree 195775656565, degree 195775656565, degree 195775656565, degree 195775656565656565656565665656656656656656	0.871 5, name: LR, 494042}, sub: 0.8824 ree: 2, gamma: A, probability: 1}, sub: {cat-OVER, type: 0.8687 name: LR, 4}, sub: {ran-vM, probabil-797983}, sub: 0.8713
egorical_f SMOTEN Random {classifier penalty_sc{k_neighb} Random {classifier auto, gam False, ran egorical_f SMOTEN Random {classifier penalty_sc dom_state Random {classifier value, gan ity: True, {k_neighb} Random	eatures: C}} 29 : {C: 29 : {C: 29 : {C: 40 : {C: 44. : ma_valudom_sta eatures: C}} 39 : {C: 65 mma_vall randon oors: 8, r 79 : {C: 65 : 65 : {C: 65 : 65 : {C: 65 : 65 : 65 : 65 : 65 : 65 : 65 : 65	LR 3.008223309'.nne+lbfgs, ra andom_state: SVM 34981981898 se: 1.6382662 tte: 36, shrin True, k_neig LR 49.91826099 +lbfgs, rando o_grp: COMI SVM 5.1801753182 L180: 0.548486 n_state: 59, andom_state: LR 52.784919927 ne+newton-c;	SMOTE 45926, 11_ratio: 0.3154 100m_state: 29, tol: 0. 29, smo_grp: OVER, tyl SMOTENC 237, coef0: -0.136870152 2647225437, kernel: line king: False, tol: 0.0326 2647225437, kernel: line king: False, tol: 0.0326 2647225437, kernel: line king: False, tol: 0.00800 31NE, type: SMOTETom SMOTE 3949, coef0: 0.434763950 3949, coef0: 0.434763950 3949, coef0: 0.434763950 3949, coef0: 0.434763950 39509865728, kernel: line shrinking: False, tol: (59, smo_grp: OVER, tyl SMOTENC 50671, 11_ratio: 0.9988 35, random_state: 79, tol: (59, ra	Over resampling 1920212013031 025462746291- be: SMOTE}} Over resampling 215419573, deg ar, name: SVN 919385163351 36, smo_grp: Combine resampling 194951035666, 2057066141923 ek}} Over resampling 194951035666, sek} Over resampling 194951035666141923 ek} Over resampling 1957765, degr. namer, namer 19505766141923 ek} Over resampling 1957565, degr. namer, namer 19505766141923 ek} Over 19505766141923 ek}	0.871 5, name: LR, 494042}, sub: 0.8824 ree: 2, gamma: A, probability: 1}, sub: {cat-OVER, type: 0.8687 name: LR, 4}, sub: {ran-over: 4}, sub
egorical_f SMOTEN Random {classifier penalty_sc{k_neighb} Random {classifier auto, gam False, ran egorical_f SMOTEN Random {classifier penalty_sc dom_state Random {classifier value, gan ity: True, {k_neighb} Random	eatures: C}} 29 : {C: 29 oliver: noors: 7, r 36 : {C: 44, ma_valudom_sta eatures: C}} 39 : {C: 59lver: 12- is 39, sm 59 : {C: 65, mma_val randonors: 8, r 79 : {C: 65, mma_val randonors: 8, r 79 : {C: 65, mma_val randonors: 8, r 79	LR 3.008223309'.nne+lbfgs, ra andom_state: SVM 34981981898 se: 1.6382662 tte: 36, shrin True, k_neig LR 49.91826099 +lbfgs, rando o_grp: COMI SVM 5.1801753182 L180: 0.548486 n_state: 59, andom_state: LR 52.784919927 ne+newton-c;	SMOTE 45926, 11_ratio: 0.3154 100m_state: 29, tol: 0. 29, smo_grp: OVER, tyl SMOTENC	Over resampling 1920212013031 025462746291- be: SMOTE}} Over resampling 215419573, deg ar, name: SVN 919385163351 36, smo_grp: Combine resampling 194951035666, 2057066141923 ek}} Over resampling 194951035666, sek} Over resampling 194951035666141923 ek} Over resampling 1957765, degr. namer, namer 19505766141923 ek} Over resampling 1957565, degr. namer, namer 19505766141923 ek} Over 19505766141923 ek}	0.871 5, name: LR, 494042}, sub: 0.8824 ree: 2, gamma: A, probability: 1}, sub: {cat-OVER, type: 0.8687 . name: LR, 4}, sub: {ran-ove: 4, gamma: VM, probabil-797983}, sub: 0.8713 c, name: LR, 223781}, sub:

Random	Seed	Classifier	Resampler	Res.Group	GM
	90	SVM	RandomUnderSampler	Under	0.8738
				resampling	
			0693, coef0: -0.478109652		
			73305926, kernel: linear, na		
			alse, tol: 0.0838735992007		
Random	109	LR	: UNDER, type: Random\ SMOTENC	Over	0.8782
Kandoni	109	LK	SWICTERC	resampling	0.6762
{classifier	: {C: 6	L 6.499336727	68036, 11_ratio: 0.39073		name: LR
			g, random_state: 109, to		
sub: {cate	gorical_t	features: True	, k_neighbors: 1, random_	state: 109, smo	_grp: OVER
type: SM					
TPE	9	SVM	ADASYN	Over	0.9005
(-1:C	. (C. 92	2427002500	 431, coef0: -0.8565857418	resampling	
			7421791713, kernel: linea		
			: True, tol: 0.03877359241		
			VER, type: ADASYN}}	, (
TPE	18	LR	SMOTE	Over	0.885
				resampling	
{classifier	: {C: 9	9.0345396721	50418, 11_ratio: 0.79554	138456572941,	name: LR,
			random_state: 18, tol: 0.		22889}, sub:
{ k_neight TPE	27	LR	18, smo_grp: OVER, type ADASYN	Over	0.8784
IPE	21	LK	ADASTN	resampling	0.6764
{classifier	: {C: 1	1.5052046158	856726, 11_ratio: 0.09879	714942648171.	name: LR
			dom_state: 27, tol: 0.0		
n_neight	ors: 4, r	andom_state:	27, smo_grp: OVER, type	: ADASYN}}	**
TPE	29	LR	NearMiss	Under	0.882
				resampling	
			623834, 11_ratio: 0.0001		
			random_state: 29, tol: 0.0 ver3: 9, smo_grp: UNDE		
{ii_iieigiii 1}}	0018. 3,	ii_lieigiloois_	vers. 9, smo_grp. UNDE	K, type. Nearly	iiss, veision
TPE	36	LR	SMOTENC	Over	0.8802
				resampling	
{classifier	: {C: {	88.846850843	78319, 11_ratio: 0.37682		name: LR
			random_state: 36, tol: 0.		
		res: True, k_n	neighbors: 1, random_state	: 36, smo_grp:	OVER, type:
SMOTEN			ADASYN	0	0.0020
				Over	0.8838
	39	SVM	ADASTN	recompling	
TPE	39			resampling	· 4 gamma
TPE {classifier	39 :: {C: 62	78072906214	454, coef0: -0.8969538024	047148, degree	
TPE {classifier auto, gam	39 :: {C: 62 ma_value	2.78072906214 e: 5.17967686		047148, degree me: SVM, prob	ability: True
TPE {classifier auto, gam random_s	39 :: {C: 62 ma_value tate: 39,	2.78072906214 e: 5.17967686 shrinking: Fa	 454, coef0: -0.8969538024 51315502, kernel: linear, na	047148, degree me: SVM, prob	ability: True
TPE {classifier auto, gam random_s	39 :: {C: 62 ma_value tate: 39,	2.78072906214 e: 5.17967686 shrinking: Fa	 454, coef0: -0.8969538024 1315502, kernel: linear, na lse, tol: 0.07667324654190	047148, degree me: SVM, prob 0562}, sub: {n_	ability: True
TPE {classifier auto, gam random_s random_s TPE	39 :: {C: 62 ma_value tate: 39, tate: 39,	2.78072906214 e: 5.17967686 shrinking: Fa smo_grp: OV	 454, coef0: -0.8969538024 1315502, kernel: linear, na lse, tol: 0.07667324654190 ZER, type: ADASYN} SMOTE	047148, degree me: SVM, prob 0562}, sub: {n_ Over resampling	pability: True, neighbors: 6,
TPE {classifier auto, gam random_s random_s TPE}	39 :: {C: 62 ma_value tate: 39, tate: 39, :: {C: 62	2.78072906214 e: 5.17967686 shrinking: Fa smo_grp: OV SVM		047148, degree me: SVM, prob 0562}, sub: {n_ Over resampling 694377761156.	oability: True, neighbors: 6, 0.9051
TPE {classifier auto, gam random_s random_s TPE} {classifier gamma: v	39 :: {C: 62 ma_value tate: 39, tate: 39,	2.78072906214 e: 5.17967686 shrinking: Fa smo_grp: OV SVM 56.334509046 mma_value: 7	454, coef0: -0.8969538024 454, coef0: -0.8969538024 13135502, kernel: linear, na lse, tol: 0.07667324654190 (ER, type: ADASYN)} SMOTE SMOTE 10852, coef0: -0.006971 1.613576658140319, kerne	047148, degree me: SVM, prob 0562}, sub: {n_ Over resampling 694377761156. I: linear, name:	oability: True, neighbors: 6, 0.9051 , degree: 4, SVM, prob-
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: Fa	39 :: {C: 62 ma_value tate: 39, tate: 39,	2.78072906214 e: 5.17967686 shrinking: Fa smo_grp: OV SVM 56.334509046 mma_value: 7 dom_state: 59		047148, degree me: SVM, prob 1562}, sub: {n_ Over resampling 694377761156, 1: linear, name: .078923124515	oability: True neighbors: 6 0.9051 , degree: 4 SVM, prob-
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: Fa {k_neight	39 :: {C: 62 ma_value tate: 39, tate: 39,	2.78072906214 e: 5.17967686 shrinking: Fa smo_grp: OV SVM 56.334509046 mma_value: 7 dom_state: 59	454, coef0: -0.8969538024 454, coef0: -0.8969538024 13135502, kernel: linear, na lse, tol: 0.07667324654190 (ER, type: ADASYN)} SMOTE SMOTE 10852, coef0: -0.006971 1.613576658140319, kerne	047148, degree me: SVM, prob 1562}, sub: {n_ Over resampling 694377761156. 1: linear, name: .078923124515 :: SMOTE}}	obility: True, neighbors: 6, 0.9051 , degree: 4, SVM, prob- 58775}, sub:
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: Fa {k_neight	39 :: {C: 62 ma_value tate: 39, tate: 39, 59 :: {C: 62 value, gar alse, rancors: 4, r	2.7807290621- e: 5.17967686 shrinking: Fa smo_grp: OV SVM 56.334509046 mma_value: 7 dom_state: 59 andom_state:	454, coef0: -0.8969538024 454, coef0: -0.8969538024 51315502, kernel: linear, na Ise, tol: 0.07667324654190 (ÆR, type: ADASYN}) SMOTE	047148, degree me: SVM, prob)562}, sub: {n_ Over resampling 694377761156 i: linear, name: .078923124515 :: SMOTE}}	obility: True, neighbors: 6, 0.9051 , degree: 4, SVM, prob- 58775}, sub:
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F{k_neight TPE	39 :: {C: 62 ma_value tate: 39, tate: 39,	2.7807290621- c: 5.17967686 shrinking: Fa smo_grp: OV SVM 56.334509046 mma_value: 7 dom_state: 59 andom_state:	454, coef0: -0.8969538024 454, coef0: -0.8969538024 51315502, kernel: linear, na Ise, tol: 0.07667324654190 (ÆR, type: ADASYN}) SMOTE	O47148, degree me: SVM, prob 0562}, sub: {n_ Over resampling 694377761156. i: linear, name: .078923124515 :: SMOTE}} Over resampling	ability: True neighbors: 6 0.9051 degree: 4 SVM, prob- 58775}, sub-
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F; {k_neight TPE {classifier penalty_s(39 The second s	.7807290621- e: 5.17967686 shrinking: Fa smo_grp: OV SVM SVM 56.334509046 mma_value: 7 dom_state: 5 andom_state: LR 27.139669834		Over resampling Over resampling	ability: True neighbors: 6 0.9051 degree: 4 SVM, prob- 58775}, sub- 0.8812 name: LR
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F; {k_neight TPE {classifier penalty_se georical_f	39 The second s	.7807290621- e: 5.17967686 shrinking: Fa smo_grp: OV SVM SVM 56.334509046 mma_value: 7 dom_state: 5 andom_state: LR 27.139669834		Over resampling Over resampling	ability: True neighbors: 6 0.9051 degree: 4 SVM, prob- 58775}, sub- 0.8812 name: LR
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F; {k_neight TPE {classifier genalty_se egorical_f SMOTEN	39 :: {C: 62 ma_value tate: 39, tate: 39, 59 :: {C: 62 ma_value, ganalse, randors: 4, r 79 :: {C: 20 lover: 12-6 l	.7807290621- e: 5.17967686 shrinking: Fa smo_grp: OV SVM 56.334509046 mma_value: 7 dom_state: 59 andom_state: LR 27.139669834 +lbfgs, randon True, k_neig		047148, degree me: SVM, prob 0562}, sub: {n_ Over resampling 694377761156 1: linear, name: .078923124515 :: SMOTE}} Over resampling 598734311664, 9131805275834 79, smo_grp: 6	ability: True neighbors: 6 0.9051 degree: 4 SVM, prob- 58775}, sub- 0.8812 name: LR t}, sub: {cat- OVER, type
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F; {k_neight TPE {classifier penalty_se egorical_f SMOTEN	39 The second s	.7807290621- e: 5.17967686 shrinking: Fa smo_grp: OV SVM SVM 56.334509046 mma_value: 7 dom_state: 5 andom_state: LR 27.139669834		Over resampling Over resampling	ability: True neighbors: 6 0.9051 degree: 4 SVM, prob- 58775}, sub- 0.8812 name: LR t}, sub: {cat- OVER, type
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F: {k_neight TPE {classifier penalty_se egorical_f SMOTEN TPE	39 :: {C: 62 ma_value tate: 39, tate: 39,	78072906214 e: 5.17967686 shrinking: Fa smo_grp: OV SVM 566.334509046 mma_value: 7 dom_state: 59 andom_state: LR 27.139669834 Hbfgs, randor True, k_neig	454, coef0: -0.8969538024 454, coef0: -0.8969538024 51315502, kernel: linear, na lse, tol: 0.07667324654190 ER, type: ADASYN} SMOTE 10852, coef0: -0.006971 .613576658140319, kerne 9, shrinking: False, tol: 0 59, smo_grp: OVER, type SMOTENC 484685, 11_ratio: 0.5555 m_state: 79, tol: 0.001543 thbors: 1, random_state: RandomUnderSampler	Over resampling	nability: True neighbors: 6 0.9051 degree: 4 SVM, prob- 58775}, sub 0.8812 name: LR sty, sub: {cat- OVER, type: 0.8841
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: vability: Fixed	39 :: {C: 62 ma_value tate: 39, tate: 39,	78072906214 e: 5.17967686 shrinking: Fa smo_grp: OV SVM Soft Sym state: 5tandom_state: LR 27.139669834 Hbfgs, randor True, k_neig SVM		Over resampling Over resampling	ability: True, neighbors: 6, 0.9051 degree: 4, SVM, prob-58775}, sub: 0.8812 name: LR, sub: {cat-OVER, type: 0.8841, degree: 3, degree: 4, de
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F; {k_neight TPE {classifier genrical_f SMOTEN TPE {classifier gamma: v agamma: v	39 :: {C: 62 ma_valutate: 39, tate: 39, tate: 39, :: {C: 62 value, garalse, rancors: 4, r 79 :: {C: 62 ceatures: (C)} 90 :: {C: (C: 62) ceatures: (C)}	.7807290621- .7807290621- :: 5.17967686 shrinking: Fa smo_grp: OV SVM 56.334509046 mma_value: 7 dom_state: 5 andom_state: LR 27.139669834 +lbfgs, randor True, k_neig SVM SVM 155.80608628 mma_value: 3		Over resampling Over resampling	ability: True neighbors: 6 0.9051 degree: 4 SVM, prob- 58775}, sub: 0.8812 name: LR 1}, sub: {cat- OVER, type- 0.8841 degree: 3 SVM, prob-
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F, {k_neight TPE {classifier penalty_se egorical_f SMOTEN TPE {classifier gamma: v ability: Ti	39 :: {C: 62 ma_value, tate: 39, tate: 39, 59 :: {C: (c'alue, garalse, rancors: 4, r 79 :: {C: (c'alue, c'alue, garalse, rancors: 4, r 79 :: {C: (c'alue, garalse, rancors: 12-601/er: 12-6	Z7.8072906214 Z7.8072906214 Z7.8072906217 Z7.8072906218 Z7		Over resampling Over resampling	name: LR l}, sub: {cat- OVER, type 0.8841 degree: 3 SVM, prob- 50046}, sub:
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F, {k_neight TPE {classifier penalty_se egorical_f SMOTEN TPE {classifier gamma: v ability: Ti	39 :: {C: 62 ma_value, tate: 39, tate: 39, 59 :: {C: (c'alue, garalse, rancors: 4, r 79 :: {C: (c'alue, c'alue, garalse, rancors: 4, r 79 :: {C: (c'alue, garalse, rancors: 12-601/er: 12-6	Z7.8072906214 Z7.8072906214 Z7.8072906217 Z7.8072906218 Z7	454, coef0: -0.8969538024 454, coef0: -0.8969538024 454, coef0: -0.8969538024 552, kernel: linear, na lse, tol: 0.07667324654190 ER, type: ADASYN} SMOTE	Over resampling Over resampling	name: LR l}, sub: {cat- OVER, type 0.8841 degree: 3 SVM, prob- 50046}, sub:
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F, {k_neight TPE {classifier genalty_se georical_f SMOTEN TPE {classifier gamma: s ability: T; {random_	39 :: {C: 62 ma_value, tate: 39, tate: 39, 59 :: {C: (c'alue, garalse, rancors: 4, r 79 :: {C: (c'alue, c'alue, garalse, rancors: 4, r 79 :: {C: (c'alue, garalse, rancors: 12-601/er: 12-6	Z7.8072906214 Z7.8072906214 Z7.8072906217 Z7.8072906218 Z7	454, coef0: -0.8969538024 454, coef0: -0.8969538024 454, coef0: -0.8969538024 552, kernel: linear, na lse, tol: 0.07667324654190 ER, type: ADASYN} SMOTE	Over resampling Over resampling	name: LR 1, sub: {cat- O.8841 . degree: 3 SVM, prob- O.8841 . degree: 3 SVM, prob- O.8843 . degree: 3 SVM, prob- S0046}, sub- mUnderSam-
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F, {k_neight TPE {classifier genalty_se gegorical_f SMOTEN TPE {classifier gamma: v ability: Tr {random_pler} } TPE	39 :: {C: 62 ma_valutate: 39, tate: 39,	Z7.8072906214 Z7.8072906214 Z7.8072906217 Z7.8072906218 Z7.8072906218 Z7.8072906218 Z8.8060834 Z7.139669834	A54, coef0: -0.8969538024 A54, coef0: -0.8969538024 A54, coef0: -0.8969538024 A54, coef0: -0.07667324654190 ER, type: ADASYN} SMOTE A10852, coef0: -0.006971 A10852, coef0: -0.25839 A10852, coef0:	Over resampling of symmetric symmetr	name: LR. 1, sub: {cate O.8812 name: LR. 1, sub: {cate OVER, type: 0.8841 degree: 3, SVM, prob- 50046}, sub: mUnderSam-
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: F, {k_neight TPE {classifier gegorical f SMOTEN TPE {classifier gamma: s ability: T {random_pler}} TPE {classifier {classifier gamma: s	39 :: {C: 62 ma_valutate: 39, tate: 39,	Z7.8072906214 e: 5.17967686 shrinking: Fa smo_grp: OV SVM 66.334509046 mma_value: 7 dom_state: 59 andom_state: LR 27.139669834 +lbfgs, randot True, k_neig SVM 155.80608628 mma_value: 3 dom_state: 90 0, replacemen SVM	A54, coef0: -0.8969538024 A54, coef0: -0.8969538024 A54, coef0: -0.07667324654190 ER, type: ADASYN} SMOTE ADASYN} SMOTE ADASYN} SMOTE ADASYN} SMOTE ADASYN} SMOTE ADASYN} SMOTE ADASYN ADASYN SMOTENC SMOTENC ADASYN ADASYN	Over resampling 69437761156. Over resampling 694377761156. Iinear, name: 0.078923124515 Over resampling 698734311664, 9131805275834 Under resampling 870193143577. Under resampling 1.1 Iinear, name: 0.1 477354342827 37, type: Rando Over resampling 1.2 Over resampling 1.3 O	name: LR. 1, sub: {cat- OVER, type: 0.9087 0.9051
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: Fi {k_neight TPE {classifier genalty_se georical_f SMOTEN TPE {classifier gamma: s ability: Ti {random_pler} TPE {classifier gamma: s ability: Ti {random_pler} TPE {classifier gamma: s ability: Ti {classifier gamm	39 :: {C: 62 ma_value tate: 39, tate: 39,	Z7.8072906214 e: 5.17967686 shrinking: Fa smo_grp: OV SVM 566.334509046 mma_value: 7 dom_state: 5.9 andom_state: LR 27.139669834 +1bfgs, randor True, k_neig SVM SVM SVM SVM SVM SVM SVM SV		Over resampling SMO193143577, Under resampling SMO193143577, Under resampling SMO193143577, Under resampling SMO193143577, Linear, name: NAT SMO19314357, Line	name: LR 13, sub: {cat- O.8841 O.8841 O.8841 OVER, type: O.8841
TPE {classifier auto, gam random_s random_s TPE {classifier gamma: v ability: Fi {k_neight TPE {classifier penalty_so egorical_f SMOTEN TPE {classifier gamma: s ability: T {random_p pler}} TPE {classifier gamma: s ability: T {random_p pler} TPE {classifier gamma: s ability: T {random_p pler}, T TPE {classifier gamma: s ability: T {random_p pler}, T TPE {classifier	39 : {C: 62 ma_valutate: 39, tate: 39, tate: 39, tate: 39,		A54, coef0: -0.8969538024 A54, coef0: -0.8969538024 A54, coef0: -0.07667324654190 ER, type: ADASYN} SMOTE ADASYN} SMOTE ADASYN} SMOTE ADASYN} SMOTE ADASYN} SMOTE ADASYN} SMOTE ADASYN ADASYN SMOTENC SMOTENC ADASYN ADASYN	Over resampling SMO193143577 Under resampling SMO193143577 Under resampling SMO193143577 Under resampling SMO193143577 Linear, name: O477354342827 Art type: Rando Over resampling SMO193143577 Contact type: Rando Over resampling	name: LR ly, sub: {cat- olygon of the color

TABLE S-38 "GLASS-0-1-6_VS_5"

Resampler

Instance

Instance

Instance

Neighbour

Instance

Instance

NearMiss

Instance

ADASYN

SMOTEENN

SMOTEENN

Classifier

RF

DT

DT

DT

RF

DT

DT

DT

RF

DT

KNN

Method

Grid

Random

Random

Seed

18

27

29

36

39

59

79

90

109

Res.Group GM Combine 0.9416 resampling 0.9289 Under HardnessThreshold resampling 0.9318 Under HardnessThreshold resampling Under 0.9318 HardnessThreshold resampling CondensedNearest 0.9223 Under resampling Under 0.9318 HardnessThreshold resampling Under 0.929 HardnessThreshold resampling 0.926 Under

0.9295

0.9318

0.9476

resampling

resampling

resampling

Combine resampling

Under

Over

Over

{classifier: {algorithm: brute, n_neighbors: 7, name: KNN, p: 9, random_state: 9, weights: distance}, sub: {n_neighbors: 6, random_state: 9, smo_grp: OVER, type: ADASYN}} KNN SMOTEENN Random Combine

HardnessThreshold

resampling {classifier: {algorithm: brute, n_neighbors: 5, name: KNN, p: 11, random_state: 18, weights: distance}, sub: {random_state: 18, smo_grp: COMBINE, type: SMO-TEENN}} KNN SMOTE

resampling {classifier: {algorithm: kd_tree, n_neighbors: 8, name: KNN, p: 18, random_state: 27, weights: uniform}, sub: {k_neighbors: 6, random_state: 27, smo_grp: OVER, type:

SMOTE}} BorderlineSMOTE Over Random resampling

{classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: sqrt, min_samples_leaf: 8, min_samples_split: 16, n_estimators: 65, name: RF, random_state: 29}, sub: {k_neighbors: 3, kind: borderline-1, m_neighbors: 3, random_state: 29, smo_grp: OVER, type: BorderlineSMOTE}}
Random | 36 | DT | SMOTEENN | C

SMOTEENN 36 Combine resampling {classifier: {criterion: gini, max_depth: 8, max_features: 1, min_samples_leaf: 2,

min_samples_split: 3, name: DTC, random_state: 36}, sub: {random_state: 36}, smo_grp: COMBINE, type: SMOTEENN}} DT RandomOverSampler Random 39 Over

resampling {classifier: {criterion: gini, max_depth: 11, max_features: 1, min_samples_leaf: 5, min_samples_split: 13, name: DTC, random_state: 39}, sub: {random_state: 39}, smo_grp: OVER, type: RandomOverSampler}}

RF Random 59 RandomOverSampler Over resampling

{classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: gini, max_features: sqrt, min_samples_leaf: 6, min_samples_split: 3, n_estimators: 144, name: RF, random_state: 59}, sub: {random_state: 59, smo_grp: OVER, type: Ran $domOverSampler\}\}$

Random KNN ADASYN Over resampling {classifier: {algorithm: ball_tree, n_neighbors: 7, name: KNN, p: 16, random_state:

79, weights: uniform}, sub: {n_neighbors: 5, random_state: 79, smo_grp: OVER, type: ADASYN}}

continued on the next column

ADASYN}}

TABLE S-38 "GLASS-0-1-6_VS_5" - CONTINUED FROM PREVIOUS COLUMN

		T 67 10			
Method	Seed	Classifier		Res.Group	GM
Random	90	KNN	SMOTEENN	Combine resampling	0.9569
{classifier	: {algor	ithm: auto,	n_neighbors: 1, name:		random_state:
	nts: dista		andom_state: 90, smo_g		
Random	109	KNN	SMOTETomek	Combine	0.9511
(-1'£	. (-1:	41		resampling	
			_neighbors: 6, name: KN om_state: 109, smo_grp:		
TPE	9	KNN	SMOTETomek	Combine resampling	0.954
{classifier	: {algori	ithm: ball tre	e, n_neighbors: 6, name		random state:
			ndom_state: 9, smo_grp		
TPE	18	KNN	SMOTEENN	Combine	0.9569
Lelaccifier	- Lalgori	thm: brute r	lneighbors: 1, name: K	resampling	dom state: 18
			state: 18, smo_grp: CO		
TPE	27	RF	AllKNN	Under	0.9913
II L	21	l Ki	America	resampling	0.5513
{classifier	: {boots	trap: True. c	lass_weight: balanced_s		erion: entropy.
			leaf: 1, min_samples_spl		
RF, rando	m state:	27}, sub: {al	low_minority: False, kind	d sel: mode, n	neighbors: 17,
		, type: AllKN			
TPE	29	DT	SMOTEENN	Combine	0.9574
				resampling	
{classifier	: {criter	ion: gini, ma	ax_depth: 10, max_featt	ires: sqrt, min	_samples_leaf:
7, min_sa	imples_s	plit: 13, nam	e: DTC, random_state:	29}, sub: {rand	dom_state: 29,
smo_grp:	COMBI	NE, type: SM	OTEENN}}		
TPE	36	RF	SMOTEENN	Combine resampling	0.9564
{classifier	: {bootst	ran: False, cla	ass_weight: balanced, cri		max features:
			samples_split: 18, n_es		
			state: 36, smo_grp: COM		
TPE	39	RF	No	No	0.9593
			resampling	resampling	
{classifier	: {boots	strap: False,	class_weight: balanced	l_subsample, c	riterion: gini,
max_featu	ıres: 1, n	nin_samples_l	eaf: 2, min_samples_spli	t: 16, n_estimat	tors: 79, name:
RF, rando	m_state:	39}, sub: {sr	no_grp: NO, type: NO}}		
TPE	59	RF	RepeatedEdited	Under	0.9445
			NearestNeighbours	resampling	
			class_weight: balanced_s		
			les_leaf: 4, min_sample		
			ub: {kind_sel: all, n_nei	ghbors: 3, smo_	_grp: UNDER,
<u>, , , , , , , , , , , , , , , , , , , </u>		tedNearestNe			
TPE	79	RF	BorderlineSMOTE	Over	0.9511
(alas-:£	(h <	tuom. E-1	loss maisht 1-1 1	resampling	
			class_weight: balanced_s		
			eaf: 13, min_samples_spl k_neighbors: 3, kind: b		
			ER, type: BorderlineSM		_neignbois: 5,
TPE	90	RF	RandomOverSampler	Over	0.9387
1115	20	IXI .	Kandomoversampler	resampling	0.9367
{classifier	· {bootst	ran: False, cla	ss_weight: None, criterio		features: sort
			les_split: 2, n_estimators		
			no_grp: OVER, type: Ra		
TPE	109	KNN	ADASYN	Over	0.9574
11.	107			resampling	0.7574
{classifier	: {algori	thm: auto. n	neighbors: 5, name: KN		om state: 109.
			ghbors: 4, random_state:		
A D A CX D		, , , , , , , , , , , , , , , , , , , ,	, <u></u>	-5.P	., ., r.

TABLE S-39 "SHUTTLE-C2-VS-C4"

GM Method Seed Classifier Resampler Res.Group RandomUnderSampler Grid RF Under 1.0 resampling RF 1.0 Grid 18 NearMiss Under resampling Grid 27 RF ClusterCentroids Under 1.0 resampling Grid 29 RF ClusterCentroids 1.0 Under resampling Grid 36 RF NearMiss Under 1.0 resampling Grid 39 RF NearMiss Under 1.0 resampling 59 RF Grid ClusterCentroids 1.0 Under resampling 79 RF NearMiss Grid 1.0 Under resampling 90 RF Under 1.0 Grid RandomUnderSampler resampling Grid 109 RF ClusterCentroids Under 1.0 resampling Random DT BorderlineSMOTE Over 1.0 resampling {classifier: {criterion: gini, max_depth: 3, max_features: sqrt, min_samples_leaf: 5, min_samples_split: 18, name: DTC, random_state: 9}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 9, random_state: 9, smo_grp: OVER, type: BorderlineS-MOTE}} Random 18 Instance HardnessThreshold resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: gini, max_features: 1, min_samples_leaf: 14, min_samples_split: 14, n_estimators: 102, name: RF, random_state: 18}, sub: {cv: 6, estimator: adaboost, random_state: 18, smo_grp: UNDER, type: InstanceHardnessThreshold}} Random 27 RF TomekLinks Under resampling {classifier: {bootstrap: False, class_weight: balanced, criterion: entropy, max_features: sqrt, min_samples_leaf: 5, min_samples_split: 2, n_estimators: 100, name: RF, random_state: 27}, sub: {smo_grp: UNDER, type: TomekLinks}} 29 RF Random Instance Under HardnessThreshold resampling {classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: gini, max_features: 1, min_samples_leaf: 8, min_samples_split: 11, n_estimators: 145, name: RF, random_state: 29}, sub: {cv: 6, estimator: knn, random_state: 29, smo_grp: UNDER, type: InstanceHardnessThreshold}} RF EditedNearest Under Random Neighbours resampling {classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: gini, max_features: log2, min_samples_leaf: 7, min_samples_split: 6, n_estimators: 119, name: RF, random_state: 36}, sub: {kind_sel: mode, n_neighbors: 4, smo_grp: UNDER, type: EditedNearestNeighbours}} DT RandomOverSampler Random Over resampling {classifier: {criterion: gini, max_depth: 18, max_features: log2, min_samples_leaf: 7, min_samples_split: 4, name: DTC, random_state: 39}, sub: {random_state: 39, smo_grp: OVER, type: RandomOverSampler}} RF RepeatedEdited Under Random NearestNeighbours resampling {classifier: {bootstrap: False, class_weight: balanced_subsample, criterion: entropy, max_features: log2, min_samples_leaf: 7, min_samples_split: 4, n_estimators: 139, name: RF, random_state: 59}, sub: {kind_sel: mode, n_neighbors: 2, smo_grp: UNDER, type: RepeatedEditedNearestNeighbours}} BorderlineSMOTE Random 79 DT Over resampling {classifier: {criterion: entropy, max_depth: 3, max_features: None, min_samples_leaf: 17, min_samples_split: 2, name: DTC, random_state: 79}, sub: {k_neighbors: 2, kind: borderline-2, m_neighbors: 7, random_state: 79, smo_grp: OVER, type: BorderlineS-

MOTE}}

continued on the next column

TABLE S-39 "SHUTTLE-C2-VS-C4" - CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	AllKNN	Under	1.0
rundom	, ,	1	111111111	resampling	1.0
			ass_weight: balanced, cri		
			samples_split: 8, n_esti		
		sub: {allow_ , type: AllKN	minority: False, kind_s IN}}	el: mode, n_n	eignbors: 17,
Random	109	RF	SMOTE	Over resampling	1.0
{classifier	: {bootst	rap: True, cla	iss_weight: balanced, crit		max_features:
sqrt, min_	samples	_leaf: 6, min	_samples_split: 4, n_est	timators: 68, na	ame: RF, ran-
dom_state SMOTE}		sub: {k_neig	hbors: 3, random_state:	109, smo_grp:	OVER, type:
TPE	9	DT	BorderlineSMOTE	Over resampling	1.0
{classifier	: {criteri	on: gini, ma	x_depth: 3, max_feature		mples_leaf: 5,
min_samp	les_split	: 18, name:	DTC, random_state: 9},	sub: {k_neigh	bors: 2, kind:
borderline	-2, m_ne	eighbors: 9, 1	andom_state: 9, smo_gr	p: OVER, type:	: BorderlineS-
MOTE}}					
TPE	18	RF	No	No	1.0
(1 'C	(1 .		resampling	resampling	.,
			class_weight: balanced		
			es_leaf: 4, min_samples ub: {smo_grp: NO, type:		stillators: 97,
TPE	27	RF	TomekLinks	Under	1.0
11 L	2'	I KI	TomeREIIIKS	resampling	1.0
{classifier	: {bootst	rap: False, cla	ass_weight: balanced, cri		max features:
			_samples_split: 2, n_esti		
dom_state	: 27}, su	ib: {smo_grp:	UNDER, type: TomekL	inks}}	
TPE	29	RF	BorderlineSMOTE	Over	1.0
				resampling	
			ss_weight: balanced, crit		
			in_samples_split: 2, n_		
			ighbors: 7, kind: border		nbors: 4, ran-
			, type: BorderlineSMOT		1.0
TPE	36	RF	AliKNN	Under resampling	1.0
{classifier	: {boots	trap: False, c	class_weight: balanced, o		max features:
			samples_split: 7, n_estin		
			nority: False, kind_sel: a		
UNDER,					
TPE	39	DT	RandomOverSampler	Over	1.0
Lelaccifier	Criter	ion: gini ma	 x_depth: 4, max_feature	resampling	camples leaf:
			ne: DTC, random_state:		
			OverSampler}}	57), sub. (ranc	ioii_state. 57,
TPE	59	RF	RepeatedEdited	Under	1.0
			NearestNeighbours	resampling	
{classifier	: {boots	trap: False, o	class_weight: balanced_s	ubsample, crite	rion: entropy,
			les_leaf: 7, min_samples		
			b: {kind_sel: mode, n_ne	ighbors: 2, smo_	grp: UNDER,
		tedNearestNe	<u> </u>		
TPE	79	DT	BorderlineSMOTE	Over	1.0
(alassifian	. (anitani		nov domthi 2 mov foots	resampling	samuelas lasfi
			nax_depth: 3, max_featu : DTC, random_state: 79		
			andom_state: 79, smo_gr		
MOTE}}	2,	rigilooloi 7, 1		p. o . zzt, type	. Dorderinnes
TPE	90	RF	ClusterCentroids	Under	1.0
(1				resampling	
			lass_weight: balanced, of		
			samples_split: 5, n_estin		
			or: MiniBatchKMeans, s, voting: soft}}	random_state:	50, sino_grp:
TPE	type: Cit 109	RF	condensedNearest	Under	1.0
1112	109	IXI.	Neighbour	resampling	1.0
{classifier	: {bootst	rap: False. cl	ass_weight: balanced, cri		x features: 1.
			les_split: 3, n_estimators		
			_seeds_S: 23, random_s		

type: CondensedNearestNeighbour}}

TABLE S-40 "YEAST-1-4-5-8_VS_7"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	KNN	SMOTE	Over	0.6696
Grid	18	KNN	SMOTENC	resampling Over	0.6642
Giiu	10	KININ	SWOTENC	resampling	0.0042
Grid	27	KNN	SMOTENC	Over	0.6529
				resampling	
Grid	29	KNN	SMOTENC	Over	0.686
Grid	36	KNN	SMOTE	resampling Over	0.672
Ond	30	KINI	SWOTE	resampling	0.072
Grid	39	KNN	ClusterCentroids	Under	0.6564
~		****	21.60mm	resampling	0.66=0
Grid	59	KNN	SMOTE	Over	0.6678
Grid	79	DT	Instance	resampling Under	0.6523
Ona	'	D1	HardnessThreshold	resampling	0.0323
Grid	90	LR	SMOTENC	Over	0.6684
				resampling	
Grid	109	LR	SMOTENC	Over	0.6604
Random	9	KNN	SMOTE	resampling Over	0.6954
Kanuom	"	KININ	SMOTE	resampling	0.0934
{classifier	: {algori	thm: brute, n	_neighbors: 13, name: K		ndom state: 9,
			ighbors: 6, random_state		
SMOTE)					
Random	18	LR	SMOTENC	Over	0.656
(-1:C	. (C:	(0.12010121	(02210 11	resampling	I D
{classifier			583219, 11_ratio: 0.399 lom_state: 18, tol: 0.0095		
			hbors: 9, random_state:		
SMOTEN		rrue, k_nerg	noors. 9, random_state.	ro, smo_grp.	Overt, type.
Random	27	KNN	SMOTE	Over	0.7068
				resampling	
			_neighbors: 18, name: K		
weights: 6		, sub: {k_ne	ighbors: 9, random_state	: 27, smo_grp:	OVER, type:
Random	29	DT	RandomOverSampler	Over	0.6949
random		D1	randomoversampier	resampling	0.0717
{classifier	: {criter	ion: entropy,	max_depth: 6, max_fea		_samples_leaf:
			e: DTC, random_state: 2	29}, sub: {rand	dom_state: 29,
			OverSampler}}		
Random	36	KNN	SMOTETomek	Combine	0.6838
Lalossifian	· (algori	thm: brute n	_neighbors: 9, name: KN	resampling	dom state: 36
			om_state: 36, smo_grp:		
Tomek}}		, suoi (runu	om_state. 50, smo_g.p.	combine, t	ype. omore
Random	39	KNN	ADASYN	Over	0.7059
				resampling	
			neighbors: 10, name: Kl		
		, sub: {n_ne	ighbors: 9, random_state	: 39, smo_grp:	OVER, type:
ADASYN Random	}} 59	KNN	BorderlineSMOTE	Over	0.676
Kandon	39	WININ	BolderilleSMOTE	resampling	0.076
{classifier	: {algor	ithm: auto, r	n_neighbors: 18, name:		random state:
59, weigh	nts: dista	ince}, sub: {	k_neighbors: 9, kind: b	orderline-1, m	
random_s	tate: 59,	smo_grp: OV	ER, type: BorderlineSM	OTE}}	
Random	79	RF	EditedNearest	Under	0.6986
(1			Neighbours	resampling	
			class_weight: balanced_s		
			eaf: 16, min_samples_spli ind_sel: all, n_neighbors		
EditedNea			ma_sci. an, n_neignbors	. >, smo_grp:	CHDER, type:
	0001 1012	,, ,		tinued on the	. 1

continued on the next column

$\label{table S-40} TABLE \ S-40$ "Yeast-1-4-5-8_vs_7" — continued from previous column

YEA	51-1-4-	-3-8_VS_/	- CONTINUED FRO	JM PREVIOUS	COLUMN
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	KNN	SMOTETomek	Combine	0.6922
(alassifian	. (ი1იით	then out o	neighbors: 10, name:	resampling	om dom states 00
			om_state: 90, smo_gi		
Tomek}}		,, (, ,,,,,,
Random	109	LR	SMOTENC	Over	0.6642
(alassifian	. (C. 4	12 520692440	78022 11 matics 0.00	resampling	996 mamai I.D
			78922, 11_ratio: 0.09 m_state: 109, tol: 0.09		
			hbors: 2, random_stat		
SMOTEN					
TPE	9	SVM	Instance HardnessThreshold	Under resampling	0.6742
{classifier	: {C: 19	1 0.3857211193	3496, coef0: -0.845530		egree: 3, gamma:
			6418462727, kernel: si		
			g: False, tol: 0.062290		
			smo_grp: UNDER, typ		
TPE	18	KNN	SMOTETomek	Combine resampling	0.698
{classifier	: {algor	ithm: kd_tree	, n_neighbors: 9, nan		7, random_state:
	ts: distar	nce}, sub: {ra	indom_state: 18, smo_	grp: COMBINI	E, type: SMOTE-
Tomek}}	27	LVD	- CONTENIO		0.6051
TPE	27	LR	SMOTENC	Over resampling	0.6871
{classifier	: {C: :	1 31.774230666	73998, 11_ratio: 0.5		166, name: LR,
			dom_state: 27, tol: 0.0		
		True, k_neig	hbors: 7, random_sta	te: 27, smo_g	rp: OVER, type:
SMOTEN		LANN	CMOTE		0.7217
TPE	29	KNN	SMOTE	Over resampling	0.7217
{classifier	: {algori	thm: ball_tre	e, n_neighbors: 10, na		9, random_state:
			neighbors: 9, random_		
SMOTE}					
TPE	36	RF	RepeatedEdited	Under	0.7109
{classifier	: {boots	tran: True. c	NearestNeighbours class_weight: balanced		ni. max features:
			_samples_split: 18, n_		
			all, n_neighbors: 7, s	mo_grp: UNDI	ER, type: Repeat-
		eighbours}}	CMOTENIC		0.6052
TPE	39	LR	SMOTENC	Over resampling	0.6853
{classifier	: {C: ´	70.933728405	39601, 11_ratio: 0.2		305, name: LR,
			m_state: 39, tol: 0.022		
		True, k_neig	thbors: 7, random_sta	te: 39, smo_g	rp: OVER, type:
SMOTEN TPE	C}}	RF	SMOTEENN	Combine	0.7
IFE	39	I KI	SMOTEENN	resampling	0.7
{classifier	: {boots	trap: True, c	lass_weight: None, c		y, max_features:
			_samples_split: 3, n_6		
			state: 59, smo_grp: CO		
TPE	79	KNN	SMOTE	Over resampling	0.707
{classifier	: {algori	ithm: kd_tree	, n_neighbors: 10, nar		0, random_state:
79, weigh	ts: distan	ice}, sub: {k_	neighbors: 8, random_	state: 79, smo_	grp: OVER, type:
SMOTE}					
TPE	90	KNN	SMOTE	Over resampling	0.7323
{classifier	: {algori	thm: kd tree.	n_neighbors: 9, name:		andom state: 90.
	iniform}		ighbors: 9, random_st		
TPE	109	KNN	BorderlineSMOTE	Over	0.7181
(1 .: 2	L,			resampling	
			, n_neighbors: 10, na		
			{k_neighbors: 7, kind VER, type: Borderline		m_neignoors: 3,
- 3.1.00111_0		,o_g.p. O	, type. Borderime		

TABLE S-41 "GLASS5"

TABLE S-41 "GLASS5" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM	Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	DT	Instance	Under	0.9438	Random	90	RF	RandomOverSampler	Over	0.9512
			HardnessThreshold	resampling		(-1:E	(1 4 -	T	1	resampling	
Grid	18	DT	CondensedNearest	Under	0.9463				lass_weight: balanced_st es_leaf: 5, min_samples_		
Grid	27	DT	Neighbour Instance	resampling Under	0.9438				ub: {random_state: 90, si		
Ona		2.	HardnessThreshold	resampling	0.5.50	mOverSar					
Grid	29	DT	CondensedNearest	Under	0.9438	Random	109	DT	RandomOverSampler	Over	0.9568
Grid	36	RF	Neighbour Instance	resampling Under	0.9438	{classifier	- {criteri	on oini max		resampling	mnles leaf: 2
Giiu	30	KI	HardnessThreshold	resampling	0.9436				OTC, random_state: 109		
Grid	39	DT	Instance	Under	0.9438		OVER,	type: Random	OverSampler}}		
C.: 1	50	DT	HardnessThreshold	resampling	0.0420	TPE	9	RF	EditedNearest	Under	0.9628
Grid	59	DI	CondensedNearest Neighbour	Under resampling	0.9438	{classifier	" {bootst	ran: False, cl:	Neighbours ass_weight: balanced, crit	resampling erion: entropy	max features:
Grid	79	DT	Instance	Under	0.9414				samples_split: 4, n_estin		
0.11	00	D.M.	HardnessThreshold	resampling	0.0420				mode, n_neighbors: 7, si	no_grp: UNDE	R, type: Edit-
Grid	90	DT	CondensedNearest Neighbour	Under resampling	0.9438	edNearest			A 111ZNINI	TT. 4	0.0620
Grid	109	DT	Instance	Under	0.9438	TPE	18	RF	AllKNN	Under resampling	0.9628
			HardnessThreshold	resampling		{classifier	: {boots	strap: False,	class_weight: balanced		riterion: gini,
Random	9	RF	RandomOverSampler	Over	0.9488				eaf: 5, min_samples_spli		
{classifier	{boots	tran: True c	lass_weight: balanced_s	resampling	erion: entropy				low_minority: True, kind	_sel: mode, n_	neighbors: 10,
			es_leaf: 8, min_samples			TPE	27	, type: AllKN	OneSidedSelection	Under	0.9686
		_state: 9}, su	ib: {random_state: 9, sn	no_grp: OVER	, type: Rando-	1112	21	KI	OlicsidedSelection	resampling	0.9080
mOverSan	. ,,	DE	D 1 O C 1	0	0.0400				class_weight: balanced_s	ubsample, crite	
Random	18	RF	RandomOverSampler	Over resampling	0.9488				eaf: 2, min_samples_split		
{classifier:	{bootst	rap: True, cla	ass_weight: None, criter		_features: sqrt,			eSidedSelecti	neighbors: 8, n_seeds_S:	i, random_state	: 27, SIIIO_grp:
	_	_	nples_split: 12, n_estim	,	· · · · · · · · · · · · · · · · · · ·	TPE	29	RF	Instance	Under	0.9628
dom_state pler}}	18}, s	ub: {random_	state: 18, smo_grp: OV	ER, type: Ran	idomOverSam-		L		HardnessThreshold	resampling	
Random	27	RF	Instance	Under	0.9598				ass_weight: balanced, crit camples_split: 8, n_estin		
rundom			HardnessThreshold	resampling	0.5550				estimator: decision-tree,		
			lass_weight: balanced, o					stanceHardnes			_,g- _F .
			amples_split: 17, n_esti estimator: decision-tree,			TPE	36	DT	SMOTEENN	Combine	0.9529
		tanceHardnes		random_state.	zr, smo_grp.		· Jeriteri	ion: gini ma		resampling	nles leaf: 16
Random	29	RF	Instance	Under	0.9537				DTC, random_state: 36		
(1 'C		. E1	HardnessThreshold	resampling		smo_grp:		NE, type: SM		,,	
			class_weight: balanced eaf: 8, min_samples_split			TPE	39	RF	OneSidedSelection	Under	0.9876
			cv: 6, estimator: knn,			Sclassifier	" ∫boots	tran: False (lass_weight: balanced, o	resampling	may features:
		tanceHardnes							samples_split: 13, n_esti		
Random	36	DT	SMOTEENN	Combine	0.9529				bors: 10, n_seeds_S: 4,	$random_state:$	39, smo_grp:
{classifier	{criteri	on gini mas	_depth: 15, max_feature	resampling	nnles leaf: 16			eSidedSelecti			
			DTC, random_state: 36			TPE	59	DT	Instance HardnessThreshold	Under resampling	0.9568
		NE, type: SM				{classifier	: {criteri	on: entropy, n	nax_depth: 12, max_featu		samples_leaf:
Random	39	DT	RandomOverSampler	Over	0.9826	2, min_sa	mples_sp	olit: 8, name:	DTC, random_state: 59}	, sub: {cv: 7, 6	estimator: knn,
{classifier:	{criter	on: gini. ma	x_depth: 11, max_featur	resampling res: 1. min sa	mples leaf: 5.				DER, type: InstanceHard		
			DTC, random_state: 39			TPE	79	RF	TomekLinks	Under resampling	0.9628
		* *	OverSampler}}			{classifier	: {boots	trap: False, o	class_weight: balanced_s		erion: entropy,
Random	59	RF	RandomOverSampler	Over	0.9512				eaf: 4, min_samples_split		ors: 100, name:
{classifier	{boots	tran: False	class_weight: balanced	resampling subsample of	riterion: gini				no_grp: UNDER, type: T		0.0760
			es_leaf: 6, min_samples			TPE	90	RF	No resampling	No resampling	0.9568
			sub: {random_state: 59,	smo_grp: OVE	ER, type: Ran-	{classifier	: {boots	trap: False, c	class_weight: balanced, of		max_features:
domOverS	ampler} 79		EditadNagrast	Undar	0.9488				samples_split: 15, n_esti	mators: 66, na	me: RF, ran-
Random	19	RF	EditedNearest Neighbours	Under resampling	0.9468				NO, type: NO}}	Under	0.0620
{classifier:	{boots	rap: False, c	lass_weight: balanced_s		erion: entropy,	TPE	109	RF	RepeatedEdited NearestNeighbours	Under resampling	0.9628
			eaf: 3, min_samples_spli			{classifier	: {boots	trap: False, o	class_weight: balanced_s		erion: entropy,
RF, randor EditedNea			nd_sel: all, n_neighbors:	18, smo_grp:	UNDER, type:				eaf: 2, min_samples_split		
Luncuivea	i con verg	noours;;	con	tinued on the	next column			109}, sub: {1	cind_sel: all, n_neighbors	: 1, smo_grp: \	UNDER, type:

TABLE S-42 "YEAST-2_VS_8"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	DT	Instance	Under	0.8216
			HardnessThreshold	resampling	
Grid	18	KNN	SVMSMOTE	Over	0.7927
Calif	27	DT	CMOTEENIN	resampling	0.7010
Grid	27	DT	SMOTEENN	Combine	0.7818
Grid	29	RF	RandomUnderSampler	resampling Under	0.8171
Giid	29	KI.	Kandomondersampier	resampling	0.6171
Grid	36	DT	SMOTEENN	Combine	0.7864
Gilu	30		SMOTEERIN	resampling	0.7001
Grid	39	KNN	RandomOverSampler	Over	0.7704
			•	resampling	
Grid	59	KNN	BorderlineSMOTE	Over	0.7859
				resampling	
Grid	79	DT	Instance	Under	0.8069
~		***	HardnessThreshold	resampling	0.505
Grid	90	KNN	BorderlineSMOTE	Over	0.787
Grid	109	RF	Dandam Hadar Camalar	resampling	0.7956
Gila	109	Kr	RandomUnderSampler	Under	0.7930
Random	9	RF	Neighbourhood	resampling Under	0.8341
Random	′	IXI	CleaningRule	resampling	0.0541
{classifier	: {bootst	ran: False, cla	ass_weight: balanced, crite		nax features:
			nin_samples_split: 5, n_		
			ghbors: 16, smo_grp: U		
			ghbourhoodCleaningRule		
Random	18	KNN	RandomOverSampler	Over	0.8022
			•	resampling	
			_neighbors: 21, name: Kl		
	iniform}	, sub: {randor	n_state: 18, smo_grp: OV	ER, type: Rand	omOverSam-
pler}}					
Random	27	KNN	SMOTE	Over	0.8055
	L			resampling	
			_neighbors: 18, name: KN		
		, sub: {k_nei	ghbors: 9, random_state:	27, smo_grp:	OVER, type:
SMOTE}	29	RF	ClusterCentroids	Under	0.7908
Kandom	29	KI.	CiusterCentrolus	resampling	0.7908
{classifier	· {bootst	tran: False, cl.	ass_weight: None, criterio	on oini max f	eatures: 10g2
min samn	les leaf:	7. min san	nples_split: 16, n_estima	tors: 142. nar	ne: RF. ran-
			or: MiniBatchKMeans, r		
			, voting: hard}}		
Random	36	KNN	SMOTENC	Over	0.7979
				resampling	
			n_neighbors: 17, name: K		
			rical_features: True, k_nei	ghbors: 1, rand	om_state: 36,
		type: SMOTE			
Random	39	KNN	RandomOverSampler	Over	0.8115
(1	L			resampling	
{classifier	: {algori	thm: auto, n_	neighbors: 31, name: KN	NN, p: 3, rand	om_state: 39,
	iistance}	, sub: {randor	n_state: 39, smo_grp: OV	EK, type: Rand	omOverSam-
pler}}	1.50	I/ND1	C1 + C + 11	T T 1	0.7024
Random	59	KNN	ClusterCentroids	Under	0.7936
[classifier	· Jalane	ithm: outo s	_neighbors: 1, name: KN	resampling	om state: 50
Weighter	. talgull iniformi	enh: lactim	ator: KMeans, random_st	ate: 50 cmc c	m-state. 39,
		oids, voting: s		arc. 33, 81110_8	rp. UNDER,
Random	79	SVM	CondensedNearest	Under	0.8009
Aundoni	'`	5 7 171	Neighbour	resampling	0.0009
{classifier	: {C· 1	100.74844366	989657, coef0: -0.42117		, degree: 2,
			.791626003158912, kerne		
			, shrinking: False, tol: 0		
			34, random_state: 79, sm		
densedNe			- '	- •	••

continued on the next column

TABLE S-42 "YEAST-2_VS_8" — CONTINUED FROM PREVIOUS COLUMN

"Y	EAST-2	2_vs_8" – 0	CONTINUED FROM PR	EVIOUS COLU	JMN
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	KNN	SMOTEENN	Combine resampling	0.7858
			n_neighbors: 1, name:	KNN, p: 11,	
90, weigh TEENN}}		nce}, sub: {1	random_state: 90, smo_g	grp: COMBINE	, type: SMO-
Random	109	KNN	SMOTEENN	Combine resampling	0.8093
{classifier	: {algor	ithm: brute,	n_neighbors: 13, name:		random_state:
109, weig TEENN}}		ance}, sub: {	random_state: 109, smo_	grp: COMBINE	E, type: SMO-
TPE	9	DT	Instance HardnessThreshold	Under resampling	0.823
{classifier	: {criteri	on: gini, max	_depth: 15, max_features		mples_leaf: 1,
			TC, random_state: 9}, s		
			DER, type: InstanceHardi		
TPE	18	DT	RandomOverSampler	Over	0.837
(alossifiar	· foritor	ion: gini m	 ax_depth: 19, max_featu	resampling	complex loof:
17, min_s	amples_	split: 19, nan	ne: DTC, random_state:		
TPE	27	RF	OverSampler}} Neighbourhood	Under	0.8751
IFE	21	KI'	CleaningRule	resampling	0.6731
{classifier	: {boots	strap: False,			riterion: gini,
max_featu			oles_leaf: 5, min_sample		
			sub: {n_neighbors: 17, 3245, type: Neighbourho		
TPE	29	KNN	SMOTE	Over resampling	0.8189
{classifier	: {algori	thm: auto, n	_neighbors: 22, name: K		lom state: 29,
	uniform}		ighbors: 6, random_state		
TPE	36	KNN	RandomOverSampler	Over resampling	0.8114
{classifier	: {algorit	thm: ball_tree	, n_neighbors: 20, name:		dom_state: 36.
			m_state: 36, smo_grp: OV		
TPE	39	DT	SMOTENC	Over	0.7985
				resampling	
			_depth: 7, max_features:		
			C, random_state: 39}, sul		
			39, smo_grp: OVER, type		
TPE	59	KNN	RandomOverSampler	Over resampling	0.8294
			n_neighbors: 19, name:		
pler}}			m_state: 59, smo_grp: O		
TPE	79	KNN	RandomOverSampler	Over resampling	0.8294
			n_neighbors: 18, name:		
weights: d	listance}		m_state: 79, smo_grp: O	VER, type: Ran	domOverSam-
TPE	90	DT	SMOTE	Over resampling	0.8081
{classifier	: {criteri	on: entropy, n	nax_depth: 10, max_featu		_samples_leaf:
			ne: DTC, random_state: TER, type: SMOTE}}	90}, sub: {k_	_neighbors: 9,
TPE	109	KNN	RandomOverSampler	Over	0.8005
(-1:C	(-1	41 1 11. 1		resampling	
			e, n_neighbors: 22, nam ndom_state: 109, smo_gr		
Sampler}		nnis, suo. (la		p. Over, type:	KandomOver-
r))					

TABLE S-43 "YEAST4" – CONTINUED FROM PREVIOUS COLUMN

TABLE S-43 "YEAST4"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	SVM	ClusterCentroids	Under	0.8374
0.1	10	DE	D 1 II 1 0 1	resampling	0.0702
Grid	18	RF	RandomUnderSampler	Under	0.8782
Grid	27	SVM	ClusterCentroids	resampling Under	0.8484
Onu	21	SVIVI	ClusterCentrolus	resampling	0.0404
Grid	29	RF	RandomUnderSampler	Under	0.8677
Ona		101	randomenderbampier	resampling	0.0077
Grid	36	RF	Instance	Under	0.8555
			HardnessThreshold	resampling	
Grid	39	SVM	ClusterCentroids	Under	0.8598
				resampling	
Grid	59	SVM	ClusterCentroids	Under	0.8468
0.11	70	DE.	D 1 11 1 0 1	resampling	0.0600
Grid	79	RF	RandomUnderSampler	Under	0.8609
Grid	90	SVM	ClusterCentroids	resampling	0.8485
Giid	90	SVIVI	CiusterCentrolus	Under resampling	0.6463
Grid	109	RF	RandomUnderSampler	Under	0.8817
Onu	10)	101	randomendersampler	resampling	0.0017
Random	9	RF	Neighbourhood	Under	0.8522
			CleaningRule	resampling	
{classifier	{boots	trap: False,	class_weight: balanced_su		ion: entropy,
max_featu	res: log2	2, min_sampl	es_leaf: 14, min_samples_	split: 19, n_est	imators: 134,
name: RF	, randoi	m_state: 9},	sub: {n_neighbors: 13,	smo_grp: UNI	DER, thresh-
old_cleani	ng: 0.43	42236592917	519, type: Neighbourhood	CleaningRule}	}
Random	18	KNN	ClusterCentroids	Under	0.8719
				resampling	
			_neighbors: 9, name: KN		
			ator: MiniBatchKMeans,	random_state:	18, smo_grp:
			s, voting: soft}}		0.0001
Random	27	RF	RepeatedEdited	Under	0.8801
{classifier	(boote	stron: Eoloo	NearestNeighbours class_weight: balanced_	resampling	itarian: gini
			les_leaf: 14, min_samples		
			ub: {kind_sel: all, n_neight		
		tedNearestNe		5015: 10, 5III0_	s.p. or Dan,
Random	29	RF	RepeatedEdited	Under	0.0602
Kandom	29				0.8682
Kandom	29	Ki			0.8682
			NearestNeighbours	resampling	
{classifier	: {boots	trap: False, o		resampling bsample, criter	ion: entropy,
{classifier max_featu name: RF,	: {boots res: Nor random	trap: False, one, min_samp_state: 29}, si	NearestNeighbours class_weight: balanced_su cles_leaf: 14, min_samples ub: {kind_sel: all, n_neighl	resampling bsample, criter _split: 11, n_es	ion: entropy, stimators: 70,
{classifier max_featu name: RF, type: Repo	: {boots res: Nor random eatedEdi	trap: False, one, min_samp _state: 29}, so tedNearestNe	NearestNeighbours class_weight: balanced_su bles_leaf: 14, min_samples bles {kind_sel: all, n_neighl ighbours}}	resampling bsample, criter _split: 11, n_e: bors: 10, smo_	ion: entropy, stimators: 70, grp: UNDER,
{classifier max_featu name: RF,	: {boots res: Nor random	trap: False, one, min_samp_state: 29}, si	NearestNeighbours Class_weight: balanced_su' cles_leaf: 14, min_samples, ub: {kind_sel: all, n_neighl ighbours} Instance	resampling bsample, criter _split: 11, n_estors: 10, smo_	ion: entropy, stimators: 70,
{classifier max_featu name: RF, type: Repe Random	{boots res: Nor random eatedEdit	trap: False, one, min_samp_state: 29}, sitedNearestNe	NearestNeighbours class_weight: balanced_su' les_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours} } Instance HardnessThreshold	resampling bsample, criter _split: 11, n_es bors: 10, smo_s Under resampling	ion: entropy, stimators: 70, grp: UNDER,
{classifier max_featu name: RF, type: Repo Random {classifier	: {boots res: Nor random eatedEdir 36	trap: False, one, min_samp_state: 29}, sitedNearestNe	NearestNeighbours class_weight: balanced_su eles_leaf: 14, min_samples, ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur	resampling bsample, criter _split: 11, n_e: bors: 10, smo_i Under _resampling res: log2, min_	ion: entropy, stimators: 70, grp: UNDER, 0.8627
{classifier max_featu name: RF, type: Repo Random {classifier 8, min_sai	: {boots res: Nor random eatedEdir 36 : {criteri mples_sp	trap: False, one, min_samp_state: 29}, sitedNearestNe	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples, ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold nax_depth: 11, max_featur DTC, random_state: 36}, s	resampling bsample, criter _split: 11, n_e: bors: 10, smo_i Under resampling res: log2, min_ sub: {cv: 3, esti	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None,
{classifier max_featu name: RF, type: Repo Random {classifier 8, min_sar random_st	fboots res: Nor random eatedEdi 36 {criteri mples_sp ate: 36,	trap: False, one, min_samp_state: 29}, sitedNearestNe DT on: entropy, 10lit: 4, name: smo_grp: UN	NearestNeighbours class_weight: balanced_su oles_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur DTC, random_state: 36}, s DER, type: InstanceHardr	resampling bsample, criter _split: 11, n_e: bors: 10, smo_i Under _resampling es: log2, min_ sub: {cv: 3, esti- sessThreshold}	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, }
{classifier max_featu name: RF, type: Repo Random {classifier 8, min_sai	: {boots res: Nor random eatedEdir 36 : {criteri mples_sp	trap: False, one, min_samp_state: 29}, sitedNearestNe	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples, ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold nax_depth: 11, max_featur DTC, random_state: 36}, s	resampling bsample, criter split: 11, n_e: cors: 10, smo_ under resampling res: log2, min sub: {cv: 3, esti sessThreshold} Combine	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None,
{classifier max_featu name: RF, type: Repo Random {classifier 8, min_sat random_st	{boots res: Nor random eatedEdi 36 {criteri nples_sp ate: 36, 39	trap: False, one, min_samp_state: 29}, sitedNearestNeDT on: entropy, 1 on: entropy, 1 knn	NearestNeighbours class_weight: balanced_su' cles_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours} Instance HardnessThreshold max_depth: 11, max_featu DTC, random_state: 36}, s JDER, type: InstanceHardr SMOTEENN	resampling bsample, criter split: 11, n_e: oors: 10, smo_i Under resampling res: log2, min_ ub: {cv: 3, esti sessThreshold} Combine resampling	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601
{classifier max_featu name: RF, type: Repo Random {classifier 8, min_sar random_st Random	{boots res: Nor random eatedEdii 36 {criteri mples_spate: 36, 39 {algori	trap: False, one, min_samp_state: 29}, sitedNearestNeDT on: entropy, indict, 4, name: smo_grp: UNKNN thm: brute, in	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples, ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur DTC, random_state: 36}, s DER, type: InstanceHardr SMOTEENNneighbors: 47, name: K1	resampling bsample, criter split: 11, n_e: oors: 10, smo_i Under resampling es: log2, min_ ub: {cv: 3, esti essThreshold} Combine resampling N, p: 1, randi	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39,
{classifier max_featu name: RF, type: Repo Random {classifier 8, min_sar random_st Random {classifier weights: u	{boots res: Nor random eatedEdi 36 {criteri mples_spate: 36, 39 {algori niform},	trap: False, one, min_samp_state: 29}, sitedNearestNe DT on: entropy, in hit: 4, name: smo_grp: UN KNN thm: brute, n sub: {randon}	NearestNeighbours class_weight: balanced_su les_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur DTC, random_state: 36}, sy DER, type: InstanceHardr SMOTEENNneighbors: 47, name: KNstate: 39, smo_grp: COM	resampling bsample, criter split: 11, n_e: bors: 10, smo_i Under resampling res: log2, min_ ub: {cv: 3, esti sessThreshold} Combine resampling NN, p: 1, rand BINE, type: SM	on: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN}}
{classifier max_featu name: RF, type: Repo Random {classifier 8, min_sar random_st Random	{boots res: Nor random eatedEdii 36 {criteri mples_spate: 36, 39 {algori	trap: False, one, min_samp_state: 29}, sitedNearestNeDT on: entropy, indict, 4, name: smo_grp: UNKNN thm: brute, in	NearestNeighbours class_weight: balanced_su dles_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur DTC, random_state: 36}, s DER, type: InstanceHardr SMOTEENN neighbors: 47, name: KN n_state: 39, smo_grp: COM EditedNearest	resampling bsample, criter split: 11, n_e: bors: 10, smo_; Under resampling es: log2, min_ ub: {cv: 3, esti essThreshold} Combine resampling value: resampling N, p: 1, rande BINE, type: SN Under	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39,
{classifier max_featu name: RF, type: Repe Random {classifier 8, min_sar random_st Random {classifier weights: u Random	{boots res: Nor random eatedEdi 36 {criteri mples_spate: 36, 39 {algori niform},	trap: False, one, min_sample, state: 29}, stedNearestNe DT on: entropy, 1 onit: 4, name: smo_grp: UN KNN thm: brute, n sub: {randon} RF	NearestNeighbours class_weight: balanced_su cles_leaf: 14, min_samples, ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold nax_depth: 11, max_featur DTC, random_state: 36}, st DER, type: InstanceHardr SMOTEENN neighbors: 47, name: Knstate: 39, smo_grp: COM EditedNearest Neighbours	resampling bsample, criter split: 11, n_e; bors: 10, smo_; Under resampling es: log2, min_ ub; {cv: 3, esti essThreshold} Combine resampling IN, p: 1, rand- BINE, type: SN Under resampling	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN}}
{classifier max_featu name: RF, type: Repe Random {classifier 8, min_sar random_st Random {classifier weights: u Random {classifier weights: u}	{boots res: Nor random eatedEdi 36 {criteri mples_sq ate: 36, 39 {algori niform}, 59	trap: False, one, min_samp_state: 29}, sr partial par	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples, ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featun DTC, random_state: 36}, st DER, type: InstanceHardr SMOTEENN _neighbors: 47, name: Kn n_state: 39, smo_grp: COM EditedNearest Neighbours lass_weight: balanced, cr	resampling bsample, criter split: 11, n_e; bors: 10, smo_; Under resampling res: log2, min_ sub: {cv: 3, esti} Combine resampling NN, p: 1, rand BINE, type: SN Under resampling iterion: gini, 1	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN} 0.8613 max_features:
{classifier max_featu name: RF, type: Represented Random {classifier 8, min_sar random_st Random {classifier weights: u Random {classifier None, min Random } {classifier None, min Random	{boots res: Nor random eatedEdia 36 {criteri mples_sp ate: 36, 39 {algori niform}, 59 {boots n_sample	trap: False, one, min_samp_state: 29}, sitedNearestNe DT on: entropy, inlit: 4, name: smo_grp: UN KNN thm: brute, n sub: {randon} RF trap: True, c es_leaf: 8, min	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur DTC, random_state: 36}, s DER, type: InstanceHardr SMOTEENNneighbors: 47, name: KN n_state: 39, smo_grp: COM EditedNearest Neighbours Neighbours Lass_weight: balanced, cr in_samples_split: 6, n_esti	resampling bsample, criter split: 11, n_e: bors: 10, smo_i Under resampling res: log2, min_ ub: {cv: 3, esti sessThreshold} Combine resampling NN, p: 1, rand BINE, type: SN Under resampling iterion: gini, i mators: 70, na	on: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN}} 0.8613 nax_features: me: RF, ran-
{classifier max_featu name: RF, type: Repger Random {classifier 8, min_sar random_st Random {classifier weights: u Random {classifier None, min dom_state	{boots res: Nor random eatedEdid 36 {criteri mples_sp ate: 36, 39 {algori niform}, 59 {boots _sample : 59}, su	trap: False, one, min_samp state: 29}, st tedNearestNe DT on: entropy, 1 thm: brute, n sub: {randon RF trap: True, c ss_leaf: 8, m ib: {kind_sel:	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples, ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featun DTC, random_state: 36}, st DER, type: InstanceHardr SMOTEENN _neighbors: 47, name: Kn n_state: 39, smo_grp: COM EditedNearest Neighbours lass_weight: balanced, cr	resampling bsample, criter split: 11, n_e: bors: 10, smo_i Under resampling res: log2, min_ ub: {cv: 3, esti sessThreshold} Combine resampling NN, p: 1, rand BINE, type: SN Under resampling iterion: gini, i mators: 70, na	on: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN}} 0.8613 nax_features: me: RF, ran-
{classifier max_featu name: RF, type: Repu Random {classifier 8, min_sar random_st Random {classifier weights: u Random {classifier wone, min dom_state NearestNear	{boots res: Nor random eatedEdi 36 {criteri mples_sp ate: 36, 39 {algori niform}, 59 {boots n_sample : 59}, su ighbours	trap: False, one, min_samp estate: 29}, si tedNearestNe DT on: entropy, i olit: 4, name: smo_grp: UN KNN thm: brute, n sub: {randon RF trap: True, of trap: True, of the sel: s}}	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples sub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featun DTC, random_state: 36}, s RDER, type: InstanceHardr SMOTEENN neighbors: 47, name: KN n_state: 39, smo_grp: COM EditedNearest Neighbours lass_weight: balanced, cr in_samples_split: 6, n_esti all, n_neighbors: 19, smo_	resampling bsample, criter split: 11, n_e: bors: 10, smo_i Under resampling es: log2, min_ ub: {cv: 3, esti essThreshold} Combine resampling NN, p: 1, rand BINE, type: SN Under resampling iterion: gini, 1 mators: 70, na grp: UNDER,	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN}} 0.8613 nax_features: me: RF, rantype: Edited-
{classifier max_featu name: RF, type: Repger Random {classifier 8, min_sar random_st Random {classifier weights: u Random {classifier None, min dom_state	{boots res: Nor random eatedEdid 36 {criteri mples_sp ate: 36, 39 {algori niform}, 59 {boots _sample : 59}, su	trap: False, one, min_samp state: 29}, st tedNearestNe DT on: entropy, 1 thm: brute, n sub: {randon RF trap: True, c ss_leaf: 8, m ib: {kind_sel:	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur DTC, random_state: 36}, s DER, type: InstanceHardr SMOTEENNneighbors: 47, name: KN n_state: 39, smo_grp: COM EditedNearest Neighbours Neighbours Lass_weight: balanced, cr in_samples_split: 6, n_esti	resampling bsample, criter split: 11, n_e; bors: 10, smo_i Under resampling es: log2, min_ ub; {cv: 3, esti essThreshold} Combine resampling viN, p: 1, rand- BINE, type: SN Under resampling iterion: gini, 1 mators: 70, na _grp: UNDER, Under	on: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN}} 0.8613 nax_features: me: RF, ran-
{classifier max_featu name: RF, type: Represented Random	{boots res: Nor random eatedEdi 36 {criteri mples_sp ate: 36, 39 {algori niform}, 59 {boots sample 59}, su ighbours	trap: False, one, min_samp_state: 29}, sitedNearestNeDT on: entropy, in hit: 4, name: smo_grp: UNKNN thm: brute, n sub: {randon RF} trap: True, c es_leaf: 8, mib: {kind_sel: }} RF	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur DTC, random_state: 36}, s IDER, type: InstanceHardr SMOTEENNneighbors: 47, name: KN n_state: 39, smo_grp: COM EditedNearest Neighbours Neighbours lass_weight: balanced, cr in_samples_split: 6, n_esti all, n_neighbors: 19, smo_ AllKNN	resampling bsample, criter split: 11, n_e: bors: 10, smo_q Under resampling res: log2, min_ ub: {cv: 3, esti sessThreshold} Combine resampling NN, p: 1, rand BINE, type: SN Under resampling iterion: gini, i mators: 70, na _grp: UNDER, Under resampling	on: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, 0.8601 om_state: 39, MOTEENN}} 0.8613 max_features: me: RF, rantype: Edited-0.8767
{classifier max_featu name: RF, type: Represented Random	{boots res: Nor random	trap: False, one, min_samp, state: 29}, stedNearestNe DT on: entropy, 1 bilit: 4, name: smo_grp: UN KNN thm: brute, n sub: {randon RF trap: True, c se_s_leaf: 8, mib: {kind_sel: }} RF trap: False, or	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples sub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featun DTC, random_state: 36}, s RDER, type: InstanceHardr SMOTEENN neighbors: 47, name: KN n_state: 39, smo_grp: COM EditedNearest Neighbours lass_weight: balanced, cr in_samples_split: 6, n_esti all, n_neighbors: 19, smo_	resampling bsample, criter split: 11, n_e: bors: 10, smo_i Under resampling res: log2, min_ ub: {cv: 3, esti ressThreshold} Combine resampling NN, p: 1, rand BINE, type: SN Under resampling iterion: gini, 1 mators: 70, na grp: UNDER, Under resampling bsample, criter	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN}} 0.8613 max_features: me: RF, rantype: Edited- 0.8767 ion: entropy,
{classifier max_featu name: RF, type: Represented Random	{boots res: Nor random eatedEdi 36 {criteri mples_spate: 36, 39 {algori niform}, 59 {boots n_sample: 59}, su ighbours 79 {boots res: log2	trap: False, one, min_sample state: 29}, stedNearestNeDT on: entropy, 1 one:	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold max_depth: 11, max_featur DTC, random_state: 36}, st DER, type: InstanceHardr SMOTEENN _neighbors: 47, name: KN _state: 39, smo_grp: COM EditedNearest Neighbours lass_weight: balanced, cr in_samples_split: 6, n_esti all, n_neighbors: 19, smo_ AllKNN class_weight: balanced_su class_weight: balanced_su	resampling bsample, criter split: 11, n_e: bors: 10, smo_i Under resampling es: log2, min_ ub: {cv: 3, esti essThreshold} Combine resampling NN, p: 1, rande BINE, type: SN Under resampling iterion: gini, 1 agrp: UNDER, Under Under resampling terion: gini, 1 agrp: UNDER,	ion: entropy, stimators: 70, grp: UNDER, 0.8627 samples_leaf: mator: None, } 0.8601 om_state: 39, MOTEENN}} 0.8613 max_features: me: RF, rantype: Edited- 0.8767 ion: entropy, imators: 129,
{classifier max_featu name: RF, type: Report Rendom_st Rendom_st Rendom_st Rendom_st Rendom_st Rendom_st Rendom_state NearestNe Rendom_state Nearest	{boots res: Nor random eatedEdi 36 {criteri mples_sp ate: 36, 39 {algori niform}, 59 {boots n_sample : 59}, su ighbours 79 {boots res: log2 random	trap: False, one, min_sample state: 29}, stedNearestNeDT on: entropy, 1 one:	NearestNeighbours class_weight: balanced_su des_leaf: 14, min_samples ub: {kind_sel: all, n_neighl ighbours}} Instance HardnessThreshold nax_depth: 11, max_featun DTC, random_state: 36}, s NDER, type: InstanceHardr SMOTEENN _neighbors: 47, name: KN n_state: 39, smo_grp: COM EditedNearest Neighbours lass_weight: balanced, cr in_samples_split: 6, n_esti all, n_neighbors: 19, smo_ AllKNN class_weight: balanced_su es_leaf: 19, min_samples_ ub: {allow_minority: False}	resampling bsample, criter split: 11, n_e: bors: 10, smo_i Under resampling es: log2, min_ ub: {cv: 3, esti essThreshold} Combine resampling NN, p: 1, rande BINE, type: SN Under resampling iterion: gini, 1 agrp: UNDER, Under Under resampling terion: gini, 1 agrp: UNDER,	on: entropy, stimators: 70, spp: UNDER, 0.8627 samples_leaf: mator: None, 0.8601 om_state: 39, MOTEENN}} 0.8613 max_features: me: RF, rantype: Edited- 0.8767 ion: entropy, imators: 129,

continued on the next column

Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	RepeatedEdited	Under	0.8692
			NearestNeighbour		
			lass_weight: balanc		
			<pre>n_samples_split: 2, all, n_neighbors: 16</pre>		
		eighbours}}	an, n_neighbors. 10	, sino_grp. ON	DEK, type. Kepeat-
Random	109	RF	AllKNN	Under	0.8616
				resampling	
			lass_weight: balance		
			les_leaf: 1, min_sa		
			sub: {allow_minority	y: True, kind_se	el: all, n_neighbors:
TPE	9 9	DER, type: Al	AllKNN	Under	0.8861
IIL	1	KI	AllKININ	resampling	0.8801
{classifier	: {boots	trap: False, o	lass_weight: balanc		gini, max_features:
			nin_samples_split: 1		
			ninority: True, kind_	sel: all, n_neigl	nbors: 11, smo_grp:
UNDER,			ATITZNINI	TT. d	0.0010
TPE	18	RF	AllKNN	Under resampling	0.8818
{classifier	: {boots	stran: False.	class_weight: bala		e. criterion: gini.
			es_leaf: 6, min_san		
			ub: {allow_minority		
		DER, type: Al			
TPE	27	RF	ClusterCentroids	Under	0.8875
[alossifier	· (bootes	tron: Folco al	 ass_weight: None, c	resampling	nov footures: log2
			les_split: 8, n_estim		
			KMeans, random_s		
		voting: hard}		.,	, , , , , , , , , , , , , , , , , , , ,
TPE	29	KNN	SMOTETomek	Combine	0.8581
				resampling	
			e, n_neighbors: 44,		
Tomek}}	ts: aistai	nce}, sub: {ra	ndom_state: 29, sm	o_grp: COMBI	NE, type: SMOTE-
TPE	36	RF	RepeatedEdited	Under	0.8816
IIL	30	KI	NearestNeighbour		0.8810
{classifier	: {boots	strap: False,	class_weight: bala		e, criterion: gini,
			es_leaf: 15, min_sa		
			ub: {kind_sel: all, n_	_neighbors: 13,	smo_grp: UNDER,
<u>, , , , , , , , , , , , , , , , , , , </u>		tedNearestNe	· ,,	TY 4	0.0010
TPE	39	RF	Instance HardnessThreshol	Under	0.8818
{classifier	: {bootst	ran: False, cla	ss_weight: balanced		max_features: sort.
			les_split: 7, n_estim		
39}, sub:	(cv: 8, e	stimator: Non	e, random_state: 39,	smo_grp: UND	ER, type: Instance-
Hardness					
TPE	59	RF	EditedNearest	Under	0.8976
(alossifior	· (boote	tron: Folco	Neighbours	resampling	aritarian: antrony
			class_weight: balanc es_leaf: 18, min_sar		
			ub: {kind_sel: all, n_		
		stNeighbours)			
TPE	79	RF	RepeatedEdited	Under	0.8745
			NearestNeighbour		
			ass_weight: balanced		
rvone, mi	ıı_sampl		min_samples_split:		
random e		l sub- Ikind	sel- all n neighbo	ars: 13 cma a	
	tate: 79)		_sel: all, n_neighbours}}	ors: 13, smo_g	ip. ONDER, type.
	tate: 79)	}, sub: {kind arestNeighboot RF		ors: 13, smo_g	0.8856
RepeatedI TPE	ate: 79) EditedNe	arestNeighbou	irs}} Instance HardnessThreshol	Under d resampling	0.8856
RepeatedE TPE {classifier	tate: 79} EditedNe 90 : {boots	arestNeighbou RF strap: False,	Instance HardnessThresholclass_weight: bala	Under resampling anced_subsampl	0.8856 le, criterion: gini,
RepeatedE TPE {classifier max_featu	ate: 79} EditedNe 90 : {bootstres: log	arestNeighbor RF strap: False, 2, min_samp	Instance HardnessThresholclass_weight: balales_leaf: 6, min_sa	Under resampling anced_subsamples_split: 5,	0.8856 e, criterion: gini, n_estimators: 16,
RepeatedE TPE {classifier max_featu name: RF,	ate: 79} EditedNe 90 : {boots ares: log random	arestNeighbor RF strap: False, 2, min_samp_state: 90}, su	Instance HardnessThreshol- class_weight: bala les_leaf: 6, min_sa b: {cv: 2, estimator:	Under resampling anced_subsamples_split: 5,	0.8856 e, criterion: gini, n_estimators: 16,
Repeated FTPE {classifier max_featurname: RF, UNDER,	tate: 79] EditedNe 90 : {boots ares: log random type: Ins	arestNeighbor RF strap: False, (2, min_samp_state: 90}, sustanceHardnes	Instance HardnessThreshol class_weight: bala les_leaf: 6, min_sa b: {cv: 2, estimator: sThreshold}}	Under resampling anced_subsamples_split: 5,	0.8856 le, criterion: gini, n_estimators: 16, state: 90, smo_grp:
RepeatedE TPE {classifier max_featu name: RF,	ate: 79} EditedNe 90 : {boots ares: log random	arestNeighbor RF strap: False, 2, min_samp_state: 90}, su	Instance HardnessThreshol class_weight: bala les_leaf: 6, min_sa b: {cv: 2, estimator: sThreshold}} Instance	Under resampling anced_subsamplimples_split: 5, None, random_	0.8856 e, criterion: gini, n_estimators: 16,
RepeatedH TPE {classifier max_featu name: RF, UNDER, TPE	tate: 79] EditedNe 90 : {boots ares: log random type: Ins	arestNeighbou RF strap: False, 2, min_samp _state: 90}, su stanceHardnes	Instance HardnessThreshol class_weight: bale les_leaf: 6, min_sa b: {cv: 2, estimator: sThreshold}} Instance HardnessThreshol	Under resampling nnced_subsampl mples_split: 5, None, random_ Under resampling	0.8856 le, criterion: gini, n_estimators: 16, state: 90, smo_grp: 0.8686
RepeatedF TPE {classifier max_featu name: RF, UNDER, TPE {classifier	tate: 79) EditedNe 90 : {boots res: log random type: Ins 109 : {boots	arestNeighbor RF strap: False, (2, min_samp_state: 90}, sustanceHardnes RF trap: False, (3)	Instance HardnessThreshol class_weight: bala les_leaf: 6, min_sa b: {cv: 2, estimator: sThreshold}} Instance HardnessThreshol class_weight: balance	Under resampling mples_split: 5, None, random_Under resampling ed, criterion:	0.8856 e, criterion: gini, n_estimators: 16, state: 90, smo_grp: 0.8686 gini, max_features:
RepeatedH TPE {classifier max_featu name: RF, UNDER, TPE {classifier None, min	ate: 79) EditedNe 90 : {boots res: log random type: Ins 109 : {boots n_sample	arestNeighbou RF strap: False, ,2, min_samp _state: 90}, su stanceHardnes RF trap: False, c es_leaf: 1, mi	Instance HardnessThreshol class_weight: bale les_leaf: 6, min_sa b: {cv: 2, estimator: sThreshold}} Instance HardnessThreshol	Under resampling anced_subsamplimples_split: 5, None, random_ Under resampling red, criterion: 1, n_estimators:	0.8856 e, criterion: gini, n_estimators: 16, state: 90, smo_grp: 0.8686 gini, max_features: 2, name: RF, ran-
RepeatedF TPE {classifier max_featu name: RF, UNDER, TPE {classifier None, mindom_state	ate: 79 EditedNe 90 : {boots res: log random type: Ins 109 : {boots n_sample : 109}, s	arestNeighbou RF strap: False, ,2, min_samp _state: 90}, su stanceHardnes RF trap: False, c es_leaf: 1, mi	Instance HardnessThreshol- class_weight: bala les_leaf: 6, min_sa b: {cv: 2, estimator: sThreshold}} Instance HardnessThreshol- class_weight: balanc n_samples_split: 14 stimator: None, rand	Under resampling anced_subsamplimples_split: 5, None, random_ Under resampling red, criterion: 1, n_estimators:	0.8856 e, criterion: gini, n_estimators: 16, state: 90, smo_grp: 0.8686 gini, max_features: 2, name: RF, ran-

TABLE S-44 "YEAST-1-2-8-9_VS_7"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	KNN	SMOTENC	Over	0.7232
Grid	18	LR	RandomUnderSampler	resampling Under	0.7288
Grid	27	LR	SMOTENC	resampling Over	0.7301
Grid	29	LR	RandomOverSampler	resampling Over	0.7209
			1	resampling	
Grid	36	LR	SMOTENC	Over resampling	0.7296
Grid	39	SVM	RandomUnderSampler	Under resampling	0.7262
Grid	59	KNN	RandomUnderSampler	Under resampling	0.7219
Grid	79	KNN	ClusterCentroids	Under	0.743
Grid	90	LR	SMOTENC	resampling Over	0.7295
Grid	109	KNN	RandomUnderSampler	resampling Under	0.7352
Random	9	KNN	ClusterCentroids	resampling Under	0.7464
	(1)			resampling	
9, weights	: distanc	e}, sub: {esti	e, n_neighbors: 32, name: imator: MiniBatchKMeans s, voting: hard}}		
Random	18	RF	Instance	Under	0.7516
			HardnessThreshold	resampling	
			class_weight: balanced, cr		
random_s	tate: 18}	, sub: {cv: 8,	min_samples_split: 5, n_, estimator: decision-tree,		
Random	type: Ins	tanceHardnes	SThreshold } SMOTENC	Over	0.7317
				resampling	
			25746, 11_ratio: 0.63259		
{categoric	al_featu		g, random_state: 27, tol: 0 leighbors: 3, random_state		
SMOTEN Random	29	LR	BorderlineSMOTE	Over	0.733
[alossifian	. (C: 0	M 159692170	 05479, 11_ratio: 0.15711	resampling	nama: I D
			ndom_state: 29, tol: 0.0		
{k_neighb	ors: 7,		line-1, m_neighbors: 8, r		
Random	36	LR	SMOTETomek	Combine	0.7237
{classifier	: {C: :	54.995429489	02379, 11_ratio: 0.43248	resampling 315573520132,	name: LR,
penalty_so	olver: 12	+sag, randor	n_state: 36, tol: 0.04636	30156021399}	
		o_grp: COMI KNN	BINE, type: SMOTETome		0.7414
Random	39	VININ	SMOTENC	Over resampling	0.7414
			neighbors: 39, name: KN	N, p: 17, rand	
		, sub: {catego type: SMOTE	rical_features: True, k_nei	ghbors: 6, rand	om_state: 39,
Random	59	KNN	SMOTENC	Over	0.7349
(alassifi-	. [0]~~-:	thm: out:	neighbors: 30, name: KN	resampling	om state: 50
weights: d	listance}		rical_features: True, k_nei		
Random	79	SVM	NearMiss	Under resampling	0.7542
			808813, coef0: -0.028436	6683097273097	
gamma: v	alue, gai	nma_value: 0	.9006163514445386, kern	el: poly, name:	SVM, prob-
{n_neighb			, shrinking: False, tol: 0.0 ver3: 16, smo_grp: UNDE		
1}}			conti	nued on the i	navt column

continued on the next column

TABLE S-44 "YEAST-1-2-8-9_VS_7" – CONTINUED FROM PREVIOUS COLUMN

"YEA	ST-1-2-	-8-9_VS_7	' – CONTINUED FROM I	PREVIOUS CO	DLUMN
Method	Seed	Classifier	Resampler	Res.Group	GM
Random	90	SVM	RandomOverSampler	Over resampling	0.7482
			9036, coef0: 0.181943425		
			530822155, kernel: linear		
			king: False, tol: 0.015324 k, type: RandomOverSamp		}, sub: {ran-
Random	109	KNN	SMOTENC	Over	0.7374
[classifier	: Lalgori	thm: ball tra	e, n_neighbors: 13, name:	resampling	andom states
109, weig	hts: unifo		tegorical_features: True, k		
TPE	9	KNN	SMOTENC	Over resampling	0.7557
{classifier	: {algori	ithm: brute, 1	_neighbors: 7, name: KN		dom_state: 9,
		, sub: {catego type: SMOTE	orical_features: True, k_ne	ighbors: 6, rand	dom_state: 9,
TPE	18	LR	SMOTENC	Over	0.7306
(1 '0			0.75602	resampling	
{classifier			26045, 11_ratio: 0.75682 om_state: 18, tol: 0.03262		
			hbors: 3, random_state:		
SMOTEN	C}}				
TPE	27	KNN	ClusterCentroids	Under resampling	0.774
			_neighbors: 13, name: KN	N, p: 7, rando	
			ator: MiniBatchKMeans, s, voting: hard}}	random_state:	27, smo_grp:
TPE	29	LR	SMOTENC	Over	0.7295
(1 'C	(0)	57.652426140	12621 11 : 0.2655	resampling	1.0
			12621, 11_ratio: 0.36557 andom_state: 29, tol: 0.084		
	eatures:		hbors: 4, random_state:		
TPE	36	LR	SMOTENC	Over resampling	0.7296
			104157, 11_ratio: 0.32735		
	eatures:		om_state: 36, tol: 0.01012; hbors: 5, random_state:		
TPE	39	KNN	SMOTENC	Over	0.7431
{classifier	: {algori	thm: auto, n	neighbors: 40, name: KN	resampling N, p: 17, rando	om_state: 39,
weights: c	listance}	, sub: {catego	rical_features: True, k_nei		
smo_grp: TPE	59	type: SMOTE RF	RandomUnderSampler	Under	0.7745
{classifier	· {boot	stran: True	class_weight: balanced_	resampling	iterion: gini,
max_featu	ıres: 1, n	nin_samples_	leaf: 1, min_samples_split:	18, n_estimato	rs: 45, name:
		59}, sub: {ra erSampler}}	ndom_state: 59, replaceme	nt: True, smo_g	grp: UNDER,
TPE	79	SVM	NearMiss	Under	0.7542
{classifier	: {C: 1	45.43923105	 	resampling 5683097273097	, degree: 3,
gamma: v	alue, gai	mma_value: ().9006163514445386, kern	el: poly, name:	SVM, prob-
{n_neight			, shrinking: False, tol: 0.0 ver3: 16, smo_grp: UNDE		
TPE	90	KNN	SMOTENC	Over resampling	0.7353
			e, n_neighbors: 16, name:	KNN, p: 15, r	
		rm}, sub: {ca ER, type: SM	tegorical_features: True, k_	_neighbors: 9, r	andom_state:
TPE	grp: OVE	LR	SMOTENC	Over	0.7322
				resampling	
{classifier penalty so			3441293, 11_ratio: 0.897 random_state: 109, tol: 0		name: LR, 01652}, sub:
{categoric	al_featu		eighbors: 4, random_state:		
SMOTEN	C}}				

TABLE S-45 "YEAST5"

TABLE S-45 "YEAST5" – CONTINUED FROM PREVIOUS COLUMN

Method	Seed	Classifier	Resampler	Res.Group	GM	Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	LR	SMOTE	Over	0.9786	Random	90	LR	EditedNearest	Under	0.9796
Grid	18	LR	SVMSMOTE	resampling Over	0.9796	(1 :0		1	Neighbours	resampling	111
Gila	10	LK	SVMSMOTE	resampling	0.9790				631382, 11_ratio: 0.3 g, random_state: 90, to		
Grid	27	LR	SMOTE	Over	0.9786				smo_grp: UNDER, ty		
0.1	20	* * *	OVD CONTO	resampling	0.0704	Random	109	SVM	ADASYN	Over	0.9786
Grid	29	LR	SVMSMOTE	Over resampling	0.9786					resampling	
Grid	36	LR	SVMSMOTE	Over	0.9782				205, coef0: -0.384834 4324508815, kernel:		
				resampling					shrinking: True, tol		
Grid	39	LR	SMOTE	Over	0.9786				109, smo_grp: OVER		
Grid	59	LR	SVMSMOTE	resampling Over	0.9803	TPE	9	LR	BorderlineSMOTE		0.9793
Gila		LIK	STABAGE	resampling	0.5005	(1 :6	(0	02 (017400)	5 40 1 5 7 11	resampling	0022204
Grid	79	LR	SMOTE	Over	0.9786				542157, 11_ratio: (random_state: 9, tol		
Grid	90	LR	SVMSMOTE	resampling	0.9786				line-1, m_neighbors:		
Gila	90	LK	SVMSMOTE	Over resampling	0.9786			derlineSMOTI		_	,
Grid	109	LR	SVMSMOTE	Over	0.9786	TPE	18	LR	EditedNearest	Under	0.9821
				resampling		Colossifian	" (C:	50 700/201/6	Neighbours 32694, 11_ratio: 0.9	resampling	226 nama: I B
Random	9	LR	RandomOverSampler	Over	0.9786				random_state: 18, tol		
{classifier	: {C:	56.30823672	<u> </u> 597898, 11 ratio: 0.78	resampling 381808591105.	name: LR.				smo_grp: UNDER, ty		
			m_state: 9, tol: 0.03843			TPE	27	LR	ADASYN	Over	0.9793
			type: RandomOverSamp			(-1:£	 	00.625520606	 72464, 11 ratio: 0.12	resampling	466 I.D.
Random	18	SVM	ADASYN	Over	0.9786	,			/2464, 11_ratio: 0.12 ndom_state: 27, tol:		
Jelassifier	. JC: 14	15108033949	 0203, coef0: -0.86854078	resampling	ree: 3 gamma:				27, smo_grp: OVER,		
			2965967405, kernel: lir			TPE	29	LR	EditedNearest	Under	0.9803
			shrinking: False, tol: ((1 12			Neighbours	resampling	
			18, smo_grp: OVER, typ						00742, 11_ratio: 0.08 dom state: 29, tol:		
Random	27	SVM	SMOTE	Over	0.9796	1 2-		<i>U</i> ,	smo_grp: UNDER, ty		**
{classifier	: {C: 38.	62160818287	 828, coef0: -0.25983758	resampling 15643692, degr	ree: 3. gamma:	TPE	36	LR	EditedNearest	Under	0.9832
			0933682735, kernel: lir						Neighbours	resampling	
			shrinking: True, tol: (881122}, sub:				28726, 11_ratio: 0.7 dom_state: 36, tol:		
{k_neight Random	ors: 9, r	andom_state: LR	27, smo_grp: OVER, typ SVMSMOTE	oe: SMOTE}} Over	0.9793				smo_grp: UNDER, ty		
Kandom	29	LK	SVMSMOTE	resampling	0.9793	TPE	39	LR	ADASYN	Over	0.9796
{classifier	: {C: 1	2.179162806	100543, 11_ratio: 0.762		4, name: LR,					resampling	
			indom_state: 29, tol: 0						05846, 11_ratio: 0.9		
			8, out_step: 0.58326724	72216172, ran	dom_state: 29,				g, random_state: 39, to 39, smo_grp: OVER,		
Random	36	type: SVMSM LR	RandomOverSampler	Over	0.9772	TPE	59	LR	RepeatedEdited	Under	0.9786
Rundom	30	LIK	randomo versampier	resampling	0.5772				NearestNeighbours		
			20318, 11_ratio: 0.4319						94869, 11_ratio: 0.04		
			dom_state: 36, tol: 0.049		16}, sub: {ran-				dom_state: 59, tol: smo_grp: UNDER, typ		
Random	39 36, sm	SVM	, type: RandomOverSam SMOTETomek	Combine Combine	0.9789	bours}}	. a., 11_11	icigii0013. 12,	smo_grp. CIVDER, typ	se. RepeatedEdi	tedi tedi esti telgii-
Kandom	39	3 V IVI	SWOTETOILER	resampling	0.9789	TPE	79	LR	SMOTETomek	Combine	0.98
			357, coef0: 0.944831066	7122928, degr		(1 :0		(0.450005522	20117 11 11 0 20	resampling	
			941324469, kernel: line						20447, 11_ratio: 0.20 g, random_state: 79, to		
	_	,	ing: False, tol: 0.05169 BINE, type: SMOTETom		5}, sub: {ran-				OMBINE, type: SMO		,00911003}, sub.
Random	59	SVM	ADASYN	Over	0.9796	TPE	90	LR	SVMSMOTE	Over	0.9803
rundoni		5		resampling	l l					resampling	
			028, coef0: -0.084127768						98375, 11_ratio: 0.6		
			7060163317, kernel: lir						andom_state: 90, tol 8, out_step: 0.244366		
			shrinking: True, tol: 0. 59, smo_grp: OVER, typ					type: SVMSN		0.1000 121202, 1	andom_state. 70,
Random	79	LR	SMOTETomek	Combine	0.98	TPE	109	SVM	SMOTE	Over	0.98
				resampling		(1 :2	(6.3	020/2007	1224	resampling	<u> </u>
l			07449, 11_ratio: 0.3055		· · · · · · · · · · · · · · · · · · ·				51334, coef0: 0.526111 51545835684, kernel:		
			lom_state: 79, tol: 0.0239 BINE, type: SMOTETom		2/}, sub: {ran-				shrinking: False, tol		
uom_state	. 12, SIII	o_gip. COMI		tinued on the	next column				109, smo_grp: OVER		
			com								

TABLE S-46 "ECOLI-0-1-3-7_vs_2-6"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	KNN	CondensedNearest	Under	0.8839
			Neighbour	resampling	
Grid	18	KNN	CondensedNearest	Under	0.8797
~			Neighbour	resampling	
Grid	27	LR	CondensedNearest	Under	0.9383
~		****	Neighbour	resampling	
Grid	29	KNN	CondensedNearest	Under	0.8797
~			Neighbour	resampling	
Grid	36	LR	OneSidedSelection	Under	0.9383
~			0 011 10 1	resampling	
Grid	39	LR	OneSidedSelection	Under	0.9383
0 : 1	50	*****	G 1 97	resampling	0.0505
Grid	59	KNN	CondensedNearest	Under	0.8797
C : 1	70	I D	Neighbour	resampling	0.0202
Grid	79	LR	CondensedNearest	Under	0.9383
C : 1	00	I D	Neighbour	resampling	0.0256
Grid	90	LR	CondensedNearest	Under	0.9356
Caid	100	LNIN	Neighbour	resampling	0.0707
Grid	109	KNN	CondensedNearest	Under	0.8797
D J		T D	Neighbour	resampling	0.0025
Random	9	LR	NearMiss	Under	0.8637
(-1 'C	(C)	14 4406 40001	75025 11 .: 00	resampling	100 13
			75935, 11_ratio: 0.94		
			, random_state: 9, tol		
. – –	ors: 6, 1	n_neighbors_v	ver3: 13, smo_grp: UN	NDER, type: N	earMiss, version:
2}}					
Random	18	RF	CondensedNearest	Under	0.9345
			Neighbour	resampling	
{classifier	: {boot	strap: True,	class_weight: balanc	ed_subsample,	criterion: gini
max_featu	ıres: 1,	min_samples	_leaf: 10, min_sampl	les_split: 11, r	_estimators: 78
name: RF,	random	_state: 18}, s	ub: {n_neighbors: 8, n	_seeds_S: 22, 1	andom_state: 18
smo_grp:	UNDER	type: Conde	1XI XI 1.1	1.1	
		, type. Conde	ensedNearestNeighbour	r}}	
	27	LR		r}} Under	0.8691
			NearMiss	Under	0.8691
Random	27	LR	NearMiss	Under resampling	
Random {classifier	27 : {C: (LR 59.958182980		Under resampling 9086863673142	232, name: LR
Random {classifier penalty_so	27 : {C: 6	LR 59.958182980 1+saga, rand	NearMiss 016538, 11_ratio: 0.89 dom_state: 27, tol:	Under resampling 9086863673142 0.0890329153	232, name: LR 37495629}, sub:
Random {classifier penalty_so {n_neighb	27 : {C: 6	LR 59.958182980 1+saga, rand	NearMiss 116538, 11_ratio: 0.89	Under resampling 9086863673142 0.0890329153	232, name: LR 37495629}, sub:
Random {classifier penalty_sc {n_neighb 2}}	27 : {C: 6	LR 59.958182980 1+saga, rand	NearMiss 116538, 11_ratio: 0.89 1dom_state: 27, tol: _ver3: 8, smo_grp: UN	Under resampling 9086863673142 0.0890329153	7495629}, sub:
Random {classifier penalty_so	27 : {C: (colver: 1 pors: 12,	LR 59.958182980 1+saga, rand n_neighbors	NearMiss 116538, 11_ratio: 0.88 dom_state: 27, tol: _ver3: 8, smo_grp: UN	Under resampling 9086863673142 0.0890329153 NDER, type: N	232, name: LR, 17495629}, sub: earMiss, version:
Random {classifier penalty_sc {n_neighb 2}} Random	27 : {C: (c) obver: 1 pors: 12,	LR 59.958182980 1+saga, rand n_neighbors	NearMiss 116538, 11_ratio: 0.89 10m_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling	232, name: LR (7495629), sub- earMiss, version: 0.8567
Random {classifier penalty_so {n_neighb 2}} Random {classifier	27 : {C: 6 olver: 1 oors: 12, 29 : {bootst	LR 69.958182980 1+saga, rand n_neighbors RF rap: False, cl	NearMiss 116538, 11_ratio: 0.89 10m_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, or	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entrol	232, name: LR (7495629), sub- earMiss, version: 0.8567
Random {classifier penalty_sc {n_neighb 2}} Random {classifier sqrt, min_	27 : {C: 6 olver: 1 oors: 12, 29 : {bootst samples	LR 59.958182980 1+saga, rand n_neighbors RF rap: False, clleaf: 9, min	NearMiss 116538, 11_ratio: 0.89 dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126	232, name: LR. 17495629}, sub: earMiss, version: 0.8567
Random {classifier penalty_sc{n_neighb} 2}} Random {classifier sqrt, min_ dom_state	27 : {C: (C) : {C: (C) : {Diver: 1 : {Diver: 1} : {Diver: 12, : {Bootst : {Bootst : samples : 29}, st	LR 9.958182980 1+saga, rann n_neighbors RF rap: False, cl _leaf: 9, min ib: {cv: 3, est	NearMiss 116538, 11_ratio: 0.89 dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e timator: gradient-boosti	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126	232, name: LR. 17495629}, sub: earMiss, version: 0.8567
Random {classifier penalty_sc {n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER,	27 : {C: (C: (C) obver: 1 oors: 12, 29 : {bootst_samples}: 29}, st type: Ins	LR 1+saga, rand n_neighbors RF rap: False, cl. leaf: 9, min ib: {ev: 3, est tanceHardness	NearMiss 116538, 11_ratio: 0.89 dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e imator: gradient-boosti	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_stampling.	232, name: LR, 17495629}, sub: earMiss, version: 0.8567 0.8567 py, max_features: , name: RF, ranate: 29, smo_grp:
Random {classifier penalty_sc{n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER,	27 : {C: (C) : {C: (C) : {Diver: 1 : {Diver: 1} : {Diver: 12, : {Bootst : {Bootst : samples : 29}, st	LR 9.958182980 1+saga, rann n_neighbors RF rap: False, cl _leaf: 9, min ib: {cv: 3, est	NearMiss 116538, 11_ratio: 0.88 116538, 11_	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entrop estimators: 126 ing, random_state	232, name: LR 17495629}, sub- earMiss, version: 0.8567 py, max_features; , name: RF, ran- ate: 29, smo_grp.
Random {classifier penalty_sc {n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random	27 : {C: (c) : {C: (c) : {C: (c) : {Diver: 1} : {bootst} : {bootst} : {29} : {ye} : {ye} : {10} : {1	LR 69.958182980 1+saga, rand n_neighbors RF rap: False, cl leaf: 9, min b: {cv: 3, est tanceHardnes} LR	NearMiss 16538, 11_ratio: 0.89 dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e imator: gradient-boosts sThreshold}} Instance HardnessThreshold HardnessThreshold	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_statutors under resampling resampling resampling resampling resampling resampling	232, name: LR (7495629}, sub: earMiss, version: 0.8567 py, max_features: , name: RF, ran- ate: 29, smo_grp: 0.8518
Random {classifier penalty_sc {n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random {classifier	27 : {C: (c) of the content of the c	LR 1+saga, rand n_neighbors RF rap: False, cl leaf: 9, min b: {cv: 3, est tanceHardnes} LR 95.357468987	NearMiss 16538, 11_ratio: 0.89 dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, , _samples_split: 2, n_e imator: gradient-boosts sThreshold}} Instance HardnessThreshold 43417, 11_ratio: 0.8	Under resampling 9986863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_state Under resampling 1131778232767	0.8567 0.8518 0.8518 0.8507, name: LR
Random {classifier penalty_sc{n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random {classifier penalty_sc	27 : {C: (c) obver: 1 pors: 12, 29 : {bootst samples : 29}, st type: Ins 36 : {C: (5) obver: 12	LR 99.958182980 1+saga, rand n_neighbors RF rap: False, cl_leaf: 9, min b: {cv: 3, est tanceHardnes} LR 95.357468987 +lbfgs, rando	NearMiss 116538, 11_ratio: 0.89 dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e imator: gradient-boostissThreshold}} Instance HardnessThreshold 43417, 11_ratio: 0.8 sm_state: 36, tol: 0.02	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_st: Under resampling criterion: 126 ing, random_st: Under resampling 131778232765	232, name: LR (7495629), sub: earMiss, version: 0.8567 oy, max_features: , name: RF, ranate: 29, smo_grp: 0.8518 column (707, name: LR (1637), sub: {cv: } cv: cv: } cv:
Random {classifier penalty_sc{n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random {classifier penalty_sc 5, estimat	27 : {C: (c) obver: 1 pors: 12, 29 : {bootst samples : 29}, st type: Ins 36 : {C: (5) obver: 12 tor: adal	LR 99.958182980 1+saga, rand n_neighbors RF rap: False, cl_leaf: 9, min b: {cv: 3, est tanceHardnes} LR 95.357468987 +lbfgs, rando	NearMiss 16538, 11_ratio: 0.89 dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, , _samples_split: 2, n_e imator: gradient-boosts sThreshold}} Instance HardnessThreshold 43417, 11_ratio: 0.8	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_st: Under resampling criterion: 126 ing, random_st: Under resampling 131778232765	232, name: LR (7495629), sub: earMiss, version: 0.8567 oy, max_features: , name: RF, ranate: 29, smo_grp: 0.8518 column (707, name: LR (1637), sub: {cv: } cv: cv: } cv:
Random {classifier penalty_sc{n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random {classifier penalty_sc 5, estimat nessThresi	27 : {C: (c) : {C: (d) : {Ci (d) : {	RF rap: False, cl. leaf: 9, min tb: {cv: 3, est tanceHardnes} LR 55.357468987 +lbfgs, randor	NearMiss 106538, 11_ratio: 0.89 10m_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, o_samples_split: 2, n_e imator: gradient-boostissThreshold} Instance HardnessThreshold 43417, 11_ratio: 0.8 m_state: 36, tol: 0.02 n_state: 36, smo_grp:	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_st: Under resampling 1131778232765 2855571750690 UNDER, typ	232, name: LR 17495629}, sub- earMiss, version: 0.8567 py, max_features: , name: RF, ran- ate: 29, smo_grp: 0.8518 707, name: LR 1637}, sub: {cv: e: InstanceHard-
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Random {classifier penalty_sc {n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random {classifier penalty_sc 5, estimat nessThresl Random {classifier max_featu RF, rando smo_grp: Random {classifier max_featu RF, rando smo_grp: Random {classifier Random } {classifier Random	27 : {C: {C: {C}} closes: 12, 29 : {bootst samples : {29}, st type: Ins 36 : {C: {9} closes: 12, 36 : {bootst samples : {C: {9} closes: 12, closes: 1, r closes:	RF rap: False, cl. leaf: 9, min b: {cv: 3, est tanceHardnes} LR 8537468987 Hbfgs, rando coost, randor RF trap: False, cl. leaf: 9, min b: {cv: 3, est tanceHardnes} RF trap: False, cn in, samples 39}, sub: , type: Conde RF trap: False, c s_leaf: 10, r , sub: {n_nei} ndensedNeare LR	NearMiss 16538, 11_ratio: 0.89 16om_state: 27, tol: ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e imator: gradient-boost ssThreshold} Instance HardnessThreshold 43417, 11_ratio: 0.8 m_state: 36, tol: 0.02 n_state: 36, smo_grp: CondensedNearest Neighbour Lass_weight: balanced leaf: 9, min_samples_s {n_neighbors: 36, n_s ensedNearestNeighbour CondensedNearest Neighbour Lass_weight: balanced in_samples_split: 12 ghbors: 6, n_seeds_S: estNeighbour} OneSidedSelection	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_station of the control of the contro	0.8567 0.8567 0.8567 0.8567 0.8567 0.8567 0.8568 0.8518 0.8518 0.8518 0.8518 0.8528 0.8528 10.8528 10.8528 10.8528 10.8792 11. max_features: 10.8792 11. max_features: 10.8792 11. max_features: 10.8792 11. max_features: 10.9031
Random {classifier penalty_sc {n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random {classifier penalty_sc 5, estimat nessThress Random {classifier penalty_sc 5, estimat nessThress Random {classifier nax_featu RF, rando {classifier log2, min random_st UNDER, Random {classifier log2, min random_st UNDER, Random {classifier	27 : {C: {C}: {C} closes: 12, 29 : {bootst samples: 29}, st type: Ins 36 : {C: {C} closes: 29}, st type: Ins 36 : {C: {C} closes: {C} clos	RF rap: False, cl. leaf: 9, min b: {cv: 3, est tanceHardnes} RF rap: False, cl. leaf: 9, min b: {cv: 3, est tanceHardnes} LR rap: False, cl. leaf: 9, min b: {cv: 3, est tanceHardnes} RF trap: False, cn. leaf: 9, min samples and sooost, randor leaf: 10, r. le	NearMiss 106538, 11_ratio: 0.89 1dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e imator: gradient-boosti stThreshold} Instance HardnessThreshold 43417, 11_ratio: 0.8 m_state: 36, tol: 0.02 n_state: 36, smo_grp: CondensedNearest Neighbour class_weight: balanced leaf: 9, min_samples_s [n_neighbors: 36, n_s ensedNearestNeighbour CondensedNearest Neighbour class_weight: balanced leaf: 9, min_samples_s ensedNearestNeighbour CondensedNearest Neighbour class_weight: balanced min_samples_split: 12 ghbors: 6, n_seeds_S: estNeighbour} OneSidedSelection	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_station of the control of the contro	0.8567 0.8567 0.8567 0.8567 0.8567 0.8567 0.8568 0.8518 0.8518 0.8518 0.8518 0.8518 0.8592 ini, max_features: 37, name: andom_state: 39, smo_grp. 0.8792 ini, max_features: 83, name: RF, andom_state: 59, smo_grp. 0.9031
Random {classifier penalty_sc {n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random {classifier penalty_sc 5, estimat nessThress Random {classifier penalty_sc 5, estimat nessThress Random {classifier nax_featu RF, rando {classifier log2, min random_st UNDER, Random {classifier log2, min random_st UNDER, Random {classifier	27 : {C: {C}: {C} closes: 12, 29 : {bootst samples: 29}, st type: Ins 36 : {C: {C} closes: 29}, st type: Ins 36 : {C: {C} closes: {C} clos	RF rap: False, cl. leaf: 9, min b: {cv: 3, est tanceHardnes} RF rap: False, cl. leaf: 9, min b: {cv: 3, est tanceHardnes} LR rap: False, cl. leaf: 9, min b: {cv: 3, est tanceHardnes} RF trap: False, cn. leaf: 9, min samples and sooost, randor leaf: 10, r. le	NearMiss 16538, 11_ratio: 0.89 16om_state: 27, tol: ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e imator: gradient-boost ssThreshold} Instance HardnessThreshold 43417, 11_ratio: 0.8 m_state: 36, tol: 0.02 n_state: 36, smo_grp: CondensedNearest Neighbour Lass_weight: balanced leaf: 9, min_samples_s {n_neighbors: 36, n_s ensedNearestNeighbour CondensedNearest Neighbour Lass_weight: balanced in_samples_split: 12 ghbors: 6, n_seeds_S: estNeighbour} OneSidedSelection	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_station of the control of the contro	0.8567 0.8567 0.8567 0.8567 0.8567 0.8567 0.8568 0.8518 0.8518 0.8518 0.8518 0.8518 0.8592 ini, max_features: 37, name: andom_state: 39, smo_grp. 0.8792 ini, max_features: 83, name: RF, andom_state: 59, smo_grp. 0.9031
Random {classifier penalty_sc {n_neighb} 2}} Random {classifier sqrt, min_ dom_state UNDER, Random {classifier penalty_sc 5, estimat nessThresi Random {classifier max_featu RF, randc smo_grp: Random {classifier log2, min log2, min qclassifier log2, mandom_st UNDER, Random {classifier penalty_sc	27 : {C: {C: {C}} closer: 12,	RF rap: False, cl_leaf: 9, min b: {cv: 3, est tanceHardnes} LR RF rap: False, cl_leaf: 9, min b: {cv: 3, est tanceHardnes} LR RF trap: False, randor coost, randor RF trap: False, onin_samples_ 39), sub: , type: Condo RF trap: False, onin_samples_ 10, randor RF trap: False, onin_samples_ 10, randor RF trap: False, onin_samples_ 10, randor 10	NearMiss 106538, 11_ratio: 0.89 1dom_state: 27, tol: _ver3: 8, smo_grp: UN Instance HardnessThreshold ass_weight: balanced, _samples_split: 2, n_e imator: gradient-boosti stThreshold} Instance HardnessThreshold 43417, 11_ratio: 0.8 m_state: 36, tol: 0.02 n_state: 36, smo_grp: CondensedNearest Neighbour class_weight: balanced leaf: 9, min_samples_s [n_neighbors: 36, n_s ensedNearestNeighbour CondensedNearest Neighbour class_weight: balanced leaf: 9, min_samples_s ensedNearestNeighbour CondensedNearest Neighbour class_weight: balanced min_samples_split: 12 ghbors: 6, n_seeds_S: estNeighbour} OneSidedSelection	Under resampling 9086863673142 0.0890329153 NDER, type: N Under resampling criterion: entropestimators: 126 ing, random_st: Under resampling 11317782327678855571750690 UNDER, typ Under resampling 1_subsample, c split: 4, n_estimators: 19 Under resampling 1_subsample, c split: 4, n_estimators: 19, random_st: 19, random_st: 19, random_st: 19, random_st: 10, random_s	0.8567 0.8567 0.8567 0.8567 0.8567 0.8567 0.8518 0.8518 0.8518 0.8518 0.852 0.852 0.8539 11, max_features 83, name: RF ate: 59, smo_grp 0.8792 11, max_features 83, name: RF ate: 59, smo_grp

continued on the next column

· ·	Seed	Classifier	Resampler	Res.Group	GM
Random	90	RF	AllKNN	Under	0.8743
(-1:6	(14-	F-1	.1	resampling	
			class_weight: balanced les_leaf: 13, min_sam		
			ub: {allow_minority: F		
		DER, type: Al		aise, kiiu_sei.	an, n_neignoors.
Random	109	RF	CondensedNearest	Under	0.8782
rundom	107	***	Neighbour	resampling	0.0702
{classifier	: {boots	strap: True,	class_weight: balanc	ed_subsample,	criterion: gini,
max_featu	ires: 1, n	nin_samples_	leaf: 1, min_samples_s	split: 8, n_estin	nators: 62, name:
			{n_neighbors: 22, n_s		ndom_state: 109,
			nsedNearestNeighbour		
TPE	9	RF	CondensedNearest	Under	0.9316
(alossifian	· (bootet	ron: Folco ol	Neighbour ass_weight: balanced,	resampling	w mov footures
			_samples_split: 16, n_		
			bors: 9, n_seeds_S: 4		
			estNeighbour}}	+5, Tandoni_sta	uc. 9, smo_grp.
TPE	18	LR	Instance	Under	0.8601
			HardnessThreshold	resampling	
{classifier	: {C: 6	53.291485443	05559, 11_ratio: 0.59		59, name: LR,
			dom_state: 18, tol: 0.0		
4, estimat	tor: adal		n_state: 18, smo_grp:		
nessThresl					
TPE	27	SVM	OneSidedSelection	Under	0.9326
	L	005545555	2005	resampling	
			2065, coef0: -0.684006		
			06811271687, kernel:		
			shrinking: False, to		
		_seeds_S: 12	, random_state: 27, sn	no_grp: UNDE	R, type: OneSid-
edSelectio TPE	29	RF	CondensedNearest	Under	0.9417
IPE	29	Kr	Neighbour	resampling	0.941/
{classifier	· {boots	stran: True	class_weight: balanc		criterion: gini
			eaf: 13, min_samples_s		
			n_neighbors: 20, n_s		
			ensedNearestNeighbour		
TPE	36	RF	Instance	Under	0.8795
			HardnessThreshold		
{classifier			class_weight: balanced	l_subsample, c	
{classifier max_featu	res: sqr	t, min_sampl	class_weight: balanced es_leaf: 15, min_sam	l_subsample, c ples_split: 16,	n_estimators: 3,
{classifier max_featu name: RF,	res: sqr , random	t, min_sampl _state: 36}, s	class_weight: balanced es_leaf: 15, min_sam sub: {cv: 9, estimator:	l_subsample, c ples_split: 16, decision-tree, r	n_estimators: 3,
{classifier max_featu name: RF, smo_grp:	res: sqr random UNDER	t, min_sampl _state: 36}, s , type: Instan	class_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold}	l_subsample, c ples_split: 16, decision-tree, r }	n_estimators: 3, andom_state: 36,
{classifier max_featu name: RF,	res: sqr , random	t, min_sampl _state: 36}, s	class_weight: balanced es_leaf: 15, min_sam sub: {cv: 9, estimator:	l_subsample, c ples_split: 16, decision-tree, r } Under	n_estimators: 3, andom_state: 36,
{classifier.max_featu name: RF, smo_grp: TPE	res: sqr , random UNDER 39	t, min_sampl _state: 36}, s , type: Instan LR	class_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection	i_subsample, c ples_split: 16, decision-tree, r } Under resampling	n_estimators: 3, andom_state: 36,
{classifier max_featu name: RF, smo_grp: TPE {classifier	res: sqr , random UNDER 39 : {C: 1	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564	Elass_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6	subsample, c ples_split: 16, decision-tree, r Under resampling	n_estimators: 3, andom_state: 36, 0.9338
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc	res: sqr , random UNDER 39 : {C: 1	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 2+sag, rando	Elass_weight: balanced es_leaf: 15, min_sam ub; {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 om_state: 39, tol: 0	_subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362178 0.003360184383	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR. 8050012}, sub:
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb	res: sqr , random UNDER 39 : {C: 1 obver: 12	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 2+sag, rando	Elass_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6	_subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362178 0.003360184383	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR. 8050012}, sub:
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio	res: sqr , random UNDER 39 : {C: 1 obver: 12	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 2+sag, rando	Elass_weight: balanceces_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 om_state: 39, tol: 0, random_state: 39, sn	_subsample, c ples_split: 16, decision-tree, r } Under resampling 933839636217t 0.003360184383 no_grp: UNDE	n_estimators: 3, andom_state: 36, 0.9338 387, name: LR, 8050012}, sub: R, type: OneSid-
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio	res: sqr , random UNDER 39 : {C: 1 blver: 12 ors: 1, r	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 2+sag, rando _seeds_S: 11	Elass_weight: balanced es_leaf: 15, min_sam ub; {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 om_state: 39, tol: 0	I_subsample, c ples_split: 16, decision-tree, r } Under resampling 933839636217i 0.003360184383 no_grp: UNDE	n_estimators: 3, andom_state: 36, 0.9338 387, name: LR, 8050012}, sub: R, type: OneSid-
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio	res: sqr , random UNDER 39 : {C: 1 olver: 12 oors: 1, r m}}	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 2+sag, rando _seeds_S: 11	Elass_weight: balanceces_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 om_state: 39, tol: 0, random_state: 39, sn	subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362173 .003360184383 no_grp: UNDE Under resampling	n_estimators: 3, andom_state: 36,
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio TPE {classifier {classifier	res: sqr, random UNDER 39 : {C: 1 blver: 12 bors: 1, rm} 59 : {C: 62.	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 2+sag, rando _seeds_S: 11	Elass_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 m_state: 39, tol: 0, random_state: 39, sn	i_subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362173 .003360184383 no_grp: UNDE Under resampling	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSid-0.8734 egree: 4, gamma:
{classifier max_featun name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio TPE {classifier auto, gam True, rand	res: sqr, random UNDER 39 : {C: 1 blver: 12 bors: 1, ron} 59 : {C: 62. ma_valu om_state	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 ±+sag, randc 1_seeds_S: 11 SVM 47211848203 e: 7.3173744 :: 59, shrinkir	Elass_weight: balanceces_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 cm_state: 39, tol: 0, random_state: 39, sn NearMiss 8404, coef0: -0.371485 76588613, kernel: sig gg: False, tol: 0.056664	I_subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362170 .003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: tb: (n_neighbors:
{classifier max_featun name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio TPE {classifier auto, gam True, rand	res: sqr, random UNDER 39 : {C: 1 blver: 12 bors: 1, ron} 59 : {C: 62. ma_valu om_state	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 ±+sag, randc 1_seeds_S: 11 SVM 47211848203 e: 7.3173744 :: 59, shrinkir	Elass_weight: balanceces_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 m_state: 39, tol: 0, random_state: 39, sn NearMiss 8404, coef0: -0.371485 76588613, kernel: sig	I_subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362170 .003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: tb: (n_neighbors:
{classifier max_featun name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio TPE {classifier auto, gam True, rand 15, n_neig	res: sqr, random UNDER 39 : {C: 1 blver: 12 bors: 1, ron} 59 : {C: 62. ma_valu om_state	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 ±+sag, randc 1_seeds_S: 11 SVM 47211848203 e: 7.3173744 :: 59, shrinkir	Elass_weight: balanceces_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 cm_state: 39, tol: 0, random_state: 39, sn NearMiss 8404, coef0: -0.371485 76588613, kernel: sig gg: False, tol: 0.056664	J_subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362173 .003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st arMiss, version	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: tb: {n_neighbors: i: 2}}
{classifier max_featu name: RF, smo_grp: TPE	res: sqr, random UNDER 39 : {C: 1 oliver: 12 oors: 1, rm} 59 : {C: 62. ma_valu om_state thiory. 79	t, min_sampl_state: 36}, s, type: Instan LR 4.9456985644 2+sag, randc a_seeds_S: 11 SVM 47211848203 e: 7.3173744 e: 59, shrinkiner3: 6, smo_g RF	Plass_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection OneSidedSelection OneSidedSelection OneSidedSelection OneSidedSelection NearMise NearMiss NearMiss 8404, coef0: -0.371485 76588613, kernel: sig gg: False, tol: 0.056664 grp: UNDER, type: Ne TomekLinks	J_subsample, c ples_split: 16, decision-tree, r } Under resampling 933839636215 .003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st earMiss, version Under resampling	n_estimators: 3, andom_state: 36, 0.9338 387, name: LR. 38050012}, sub: R, type: OneSiders: 4, gamma: VM, probability: bi: {n_neighbors: 2}} 0.8987
{classifier max_featun name: RF, smo_grp: TPE {classifier penalty_sc {n_neighbedSelectio TPE {classifier auto, gam True, rand 15, n_neig TPE {classifier auto, gam True, rand 15, n_neig TPE {classifier teams of the second seco	res: sqr, random UNDER 39 : {C: 1 blver: 12 oors: 1, r n} 59 : {C: 62. ma_valu om_state ghbors_v 79 : {boots }	t, min_sampl_state: 36}, s, type: Instan LR 4.9456985644 2+sag, rando a_seeds_S: 11 SVM 47211848203 e: 7.3173744 e: 59, shrinkiner3: 6, smo_g RF trap: False, o	Plass_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 m_state: 39, tol: 0, random_state: 39, sn NearMiss 8404, coef0: -0.37148576588613, kernel: sigus: False, tol: 0.056664 mp: UNDER, type: Ne TomekLinks	I_subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362175 .003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st arMiss, version Under resampling J_subsample, c	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 18050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: 1b: {n_neighbors: :: 2}} 0.8987
{classifier max_featun name: RF, smo_grp: TPE {classifier penalty_sc} {classifier auto, gam True, rand 15, n_neight TPE {classifier max_featun featun	res: sqr, random UNDER 39 : {C: 1 blver: 12 bors: 1, rn} 59 : {C: 62. ma_valu om_state_shbors_v} 79 : {boots: 1, reserved.	t, min_sampl_state: 36}, s, type: Instan LR 4.9456985644 ±+sag, randc 1_seeds_S: 11 SVM 47211848203 e: 7.3173744 :: 59, shrinkir er3: 6, smo_g RF trap: False, 6 iin_samples_l	Class_weight: balanceces_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection 068522, 11_ratio: 0.6 om_state: 39, tol: 0 orandom_state: 39, sn NearMiss NearMiss 8404, coef0: -0.371485 76588613, kernel: sig ug: False, tol: 0.056664 grp: UNDER, type: Ne TomekLinks Class_weight: balanceceaf: 11, min_samples_s	J_subsample, c ples_split: 16, decision-tree, r } Under resampling 933839636217° 0.003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st. arMiss, version Under resampling Under resampling J_subsample, c split: 2, n_estim	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: bi: {n_neighbors: : 2}} 0.8987
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio TPE {classifier auto, gam True, rand 15, n_neight feature fea	res: sqr, random UNDER 39 : {C: 1 oliver: 1/ cors: 1, r n} 59 : {C: 62. ma_valu om_state chbors_v 79 : {boots tres: 1, m _state:	t, min_sampl _state: 36}, s , type: Instan LR 4.945698564 2+sag, randc 1_seeds_S: 11 SVM 47211848203 e: 7.3173744 e: 59, shrinkir er3: 6, smo_g RF trap: False, c iin_samples_1 79}, sub: {si	Plass_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection OneSidedSelection OneSidedSelection onestate: 39, tol: 0, random_state: 39, sn NearMiss NearMis	subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362178 .003360184383 no_grp: UNDE Under resampling 54425965618, dmoid, name: S 323419143}, st arMiss, version Under resampling 1.subsample, c split: 2, n_estim :: TomekLinks}	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 18050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: tb: {n_neighbors: : 2}} 0.8987
{classifier max_featun name: RF, smo_grp: TPE {classifier penalty_sc} {classifier auto, gam True, rand 15, n_neight TPE {classifier max_featun featun	res: sqr, random UNDER 39 : {C: 1 blver: 12 bors: 1, rn} 59 : {C: 62. ma_valu om_state_shbors_v} 79 : {boots: 1, reserved.	t, min_sampl_state: 36}, s, type: Instan LR 4.9456985644 ±+sag, randc 1_seeds_S: 11 SVM 47211848203 e: 7.3173744 :: 59, shrinkir er3: 6, smo_g RF trap: False, 6 iin_samples_l	Plass_weight: balanceces_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection O68522, 11_ratio: 0.6 om_state: 39, tol: 0 , random_state: 39, sn NearMiss NearMiss 8404, coef0: -0.371485 76588613, kernel: sig gg: False, tol: 0.056664 ggp: UNDER, type: Ne TomekLinks class_weight: balancece af: 11, min_samples_s no_grp: UNDER, type CondensedNearest	subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362178, 003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, star Miss, version Under resampling Lsubsample, c polit: 2, n_estims:: TomekLinks} Under	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: bi: {n_neighbors: : 2}} 0.8987
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio TPE {classifier auto, gam True, rand 15, n_neig TPE {classifier max_featu RF, rando TPE }	res: sqr, random UNDER 39 : {C: 1 oliver: L' oors: 1, r n}} 59 : {C: 62. ma_valu om_state ghbors_v 79 : {boots res: 1, m _state: 90	t, min_sampl_state: 36}, s, type: Instan LR 4.9456985644 2+sag, rando 1_seeds_S: 11 SVM 47211848203 e: 7.3173744 e: 59, shrinkiner3: 6, smo_g RF trap: False, o tin_samples_1 79}, sub: {st} LR	Plass_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection O68522, 11_ratio: 0.6 om_state: 39, tol: 0, random_state: 39, sn NearMiss NearMiss	subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362173 0.003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st arMiss, version Under resampling 1_subsample, c split: 2, n_estim :: TomekLinks} Under resampling	n_estimators: 3, andom_state: 36, 0.9338 387, name: LR, 18050012}, sub: R, type: OneSid-0.8734 egree: 4, gamma: VM, probability: 1b: {n_neighbors: : 2}} 0.8987 riterion: entropy, ators: 120, name: } 0.8986
{classifier max_featu name: RF, smo_grp: TPE	res: sqr, random UNDER 39 : {C: 1 olver: L olver	t, min_sampl_state: 36}, s, type: Instan LR 4.9456985644 2+sag, rando a_seeds_S: 11 SVM 47211848203 e: 7.3173744 e: 59, shrinkiner3: 6, smo_g RF trap: False, o iin_samples_1 79}, sub: {st LR 5.000559498	class_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection	subsample, c ples_split: 16, decision-tree, r } Under resampling 933839636217* 0.003360184383 no_grp: UNDE Under resampling 54425965618, d dmoid, name: S 323419143}, st arMiss, version Under resampling _subsample, c split: 2, n_estim :: TomekLinks} Under resampling _subsample, c split: 2, n_estim :: TomekLinks} Under resampling 117639449687*	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 88050012}, sub: R, type: OneSiders: 4, gamma: VM, probability: ab: {n_neighbors: 2}} 0.8987 riterion: entropy, ators: 120, name: } 0.8986 715, name: LR,
{classifier max_featu name: RF, smo_grp: TPE	res: sqr, random UNDER 39 : {C: 1 oliver: L oliver: L ons: 1, r ons} 59 : {C: 62. ma_valu om_state chbors_v 79 : {boots rres: 1, m m_state: 90 : {C: 2 oliver: n	t, min_sampl_state: 36}, s, type: Instan LR 4.9456985644 2+sag, randd a_seeds_S: 11 SVM 47211848203 2: 59, shrinkir er3: 6, smo_g RF trap: False, 6 iin_samples_1 79}, sub: {si LR 5.000559498 one+sag, rai	Class_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: cv: 9, estimator: ceHardnessThreshold} OneSidedSelection	Jsubsample, c ples_split: 16, decision-tree, r } Under resampling 933839636217' 0.003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st arMiss, version Under resampling Jsubsample, c split: 2, n_estime: TomekLinks} Under resampling 1.17639449687' 0.0575817386	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: bi: {n_neighbors: : 2}} 0.8987 riterion: entropy, ators: 120, name: } 0.8986 715, name: LR, 51536812}, sub:
{classifier max_featu name: RF, smo_grp: TPE	res: sqr, random UNDER 39 : {C: 1 oliver: 1; ors: 1, r n} 59 : {C: 62. ma_valu om_state chbors_v 79 : {boots tres: 1, m m_state: 90 : {C: 2 ors: 1, r nors: 1, r nors	t, min_sampl_state: 36}, s, type: Instan LR 4.94569856442+sag, randca_seeds_S: 11 SVM 47211848203 e: 7.3173744 e: 59, shrinkirer3: 6, smo_g RF trap: False, c tin_samples_1 79}, sub: {sr LR 5.5.000559498 one+sag, ran_seeds_S: 1	class_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection	Jsubsample, c ples_split: 16, decision-tree, r } Under resampling 933839636217' 0.003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st arMiss, version Under resampling Jsubsample, c split: 2, n_estime: TomekLinks} Under resampling 1.17639449687' 0.0575817386	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSidegree: 4, gamma: VM, probability: bi: {n_neighbors: : 2}} 0.8987 riterion: entropy, ators: 120, name: } 0.8986 715, name: LR, 51536812}, sub:
{classifier max_featu name: RF, smo_grp: TPE	res: sqr, random UNDER 39 : {C: 1 oliver: L' oors: 1, r n}} 59 : {C: 62. ma_valu om_state ghbors_v 79 : {boots tres: 1, r m_state: 90 : {C: 2 oblever: n oors: 1, ors:	t, min_sampl_state: 36}, s, type: Instan	class_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection OneSidedSelection OneSidedSelection onestate: 39, tol: 0, random_state: 39, sn NearMiss NearMis	subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362179 .003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st earMiss, version Under resampling Lsubsample, c split: 2, n_estim : TomekLinks} Under resampling 117639449687' 0.0575817386 smo_grp: UNI	n_estimators: 3, andom_state: 36, 0.9338 387, name: LR, 8050012}, sub: R, type: OneSiders: 4, gamma: VM, probability: ab: {n_neighbors: : 2}} 0.8987 itterion: entropy, ators: 120, name: J, 0.8986 715, name: LR, 51536812}, sub: DER, type: Con-
{classifier max_featu name: RF, smo_grp: TPE	res: sqr, random UNDER 39 : {C: 1 oliver: 1; ors: 1, r n} 59 : {C: 62. ma_valu om_state chbors_v 79 : {boots tres: 1, m m_state: 90 : {C: 2 ors: 1, r nors: 1, r nors	t, min_sampl_state: 36}, s, type: Instan LR 4.94569856442+sag, randca_seeds_S: 11 SVM 47211848203 e: 7.3173744 e: 59, shrinkirer3: 6, smo_g RF trap: False, c tin_samples_1 79}, sub: {sr LR 5.5.000559498 one+sag, ran_seeds_S: 1	Class_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: cv: 9, estimator: ceHardnessThreshold} OneSidedSelection	subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362178 0.003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st arMiss, version Under resampling 1_subsample, c split: 2, n_estim :: TomekLinks} Under resampling 117639449687' 0.0575817386 smo_grp: UNI	n_estimators: 3, andom_state: 36, 0.9338 387, name: LR, 8050012}, sub: R, type: OneSiders: 4, gamma: VM, probability: ab: {n_neighbors: : 2}} 0.8987 itterion: entropy, ators: 120, name: J, 0.8986 715, name: LR, 51536812}, sub: DER, type: Con-
{classifier max_featu name: RF, smo_grp: TPE {classifier penalty_sc {n_neighb edSelectio TPE {classifier auto, gam True, rand 15, n_neight penalty_sc {penalty_sc {n_neighb densedNet TPE } }}}	res: sqr, random UNDER 39 : {C: 1 olver: L ores: 1, ren} 59 : {C: 62. ma_valu om_state; hbors_v 79 : {boots 1, ren} [90 : {C: 2 olver: n ores: 1, renstNeig 109	t, min_sampl_state: 36}, s, type: Instan LR 4.9456985644 ±+sag, randc a_seeds_S: 11 SVM 47211848203 e: 7.3173744 :: 59, shrinkin er3: 6, smo_g RF trap: False, c iin_samples_l 79}, sub: {si LR 5.000559498 one+sag, ran a_seeds_S: 1 jhbour} DT	Plass_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection OneSidedSelection OneSidedSelection OneSidedSelection NearMiss NearMiss NearMiss NearMiss NearMiss NearMiss NearMiss NearMiss Plase, tol: 0.056664 PromekLinks Plase, tol: 0.056664 PromekLinks Plase, tol: 0.056664 PromekLinks Plase, tol: 0.056664 PromekLinks Plase, tol: 0.056664 Plase, tol: 0.066664 Plase, tol: 0.0866664 Plase, tol: 0.0866664 Plase, tol: 0.0866666 Plase, tol: 0.08666666 Plase, tol: 0.08666666 Plase, tol: 0.086666666 Plase, tol: 0.086666666 Plase, tol: 0.0866666666666666666666666666666666666	subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362173. 003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, st arMiss, version Under resampling Lsubsample, c split: 2, n_estim s: TomekLinks} Under resampling 117639449687' 0.0575817386 smo_grp: UNI Under resampling	n_estimators: 3, andom_state: 36,
{classifier max_featu name: RF, smo_grp: TPE	res: sqr, random UNDER 39 : {C: 1 oliver: 1 ors: 1, r or	t, min_sampl_state: 36}, s, type: Instan LR 4.945698564 2+sag, randc 1_seeds_S: 11 SVM 47211848203 e: 7.3173744 2: 59, shrinkir er3: 6, smo_g RF trap: False, c iin_samples_1 79}, sub: {sr LR 5.000559498 one+sag, ran _seeds_S: 1 ghbour} DT ion: gini, ma	class_weight: balanced es_leaf: 15, min_sam ub: {cv: 9, estimator: ceHardnessThreshold} OneSidedSelection OneSidedSelection OneSidedSelection onestate: 39, tol: 0, random_state: 39, sn NearMiss NearMis	subsample, c ples_split: 16, decision-tree, r } Under resampling 9338396362173, 003360184383 no_grp: UNDE Under resampling 54425965618, d moid, name: S 323419143}, star Miss, version Under resampling subsample, c pelit: 2, n_estim :: TomekLinks} Under resampling 117639449687' 0.0575817386 smo_grp: UNI Under resampling 117639449687' 0.0575817386 smo_grp: UNI	n_estimators: 3, andom_state: 36, 0.9338 887, name: LR, 8050012}, sub: R, type: OneSid- 0.8734 egree: 4, gamma: VM, probability: tb: {n_neighbors: 2}} 0.8987 riterion: entropy, ators: 120, name: } 0.8986 715, name: LR, 11536812}, sub: DER, type: Con- 0.9446 tin_samples_leaf:

TABLE S-47 "YEAST6"

Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	LR	SMOTENC	Over	0.8827
Grid	18	LR	SMOTENC	resampling	0.8827
Ond	10	LK	SMOTENC	Over resampling	0.8627
Grid	27	KNN	RandomUnderSampler	Under	0.8835
			•	resampling	
Grid	29	LR	SMOTENC	Over	0.8824
Grid	36	LR	SMOTENC	resampling Over	0.8821
Ona	50	Liv	SMOTERC	resampling	0.0021
Grid	39	LR	SMOTENC	Over	0.8833
Grid	59	RF	D 1 II 1 0 1	resampling	0.0040
Gna	39	KF	RandomUnderSampler	Under resampling	0.8848
Grid	79	LR	SMOTENC	Over	0.881
				resampling	
Grid	90	SVM	RandomUnderSampler	Under	0.8927
Grid	109	SVM	RandomUnderSampler	resampling Under	0.8843
0.1.4	107	5 7 1.1	randomonderbampier	resampling	0.00.5
Random	9	KNN	SVMSMOTE	Over	0.8909
(1 :0	(1)	1.1	. 11 40	resampling	
9, weigh			n_neighbors: 48, name: {k_neighbors: 1, m		4, out_step:
0.8140323	35477897	731, random_s	state: 9, smo_grp: OVER,	type: SVMSM	
Random	18	KNN	SVMSMOTE	Over	0.8917
				resampling	
{classifier			ee, n_neighbors: 47, ree}, sub: {k_neighbors: 6		
0.9093372	. 16, wc	081. random	state: 18, smo_grp: OVER	. type: SVMSN	MOTE}}
Random	27	KNN	SVMSMOTE	Over	0.8868
				resampling	
{classifier	: {algo	rithm: ball_t	ree, n_neighbors: 48,	name: KNN,	p: 4, ran-
			m}, sub: {k_neighbors: 8 _state: 27, smo_grp: OVE		
Random	29	LR	BorderlineSMOTE	Over	0.8879
				resampling	
			05479, 11_ratio: 0.15711		
			ndom_state: 29, tol: 0.0 ine-1, m_neighbors: 8, r		
		lerlineSMOTE		andom_state.	29, silio_gip.
Random	36	KNN	SVMSMOTE	Over	0.8943
				resampling	
			n_neighbors: 47, name:		
			e: {k_neighbors: 1, m state: 36, smo_grp: OVER		2, out_step: MOTE}}
Random	39	KNN	NearMiss	Under	0.8935
				resampling	
			e, n_neighbors: 17, name:		
		ice}, sub: {n_ ersion: 1}}	neighbors: 1, n_neighbors	_ver3: 1, smo_	grp: UNDER,
Random	59 59	DT	RandomUnderSampler	Under	0.8871
Rundom	37	D1	Randomondersampler	resampling	0.0071
			max_depth: 7, max_featur	es: log2, min_	
			ne: DTC, random_state: 5		om_state: 59,
replaceme Random	nt: True,	smo_grp: UI	NDER, type: RandomUndo BorderlineSMOTE	erSampler}} Over	0.8886
Kandoni	19	LK	DoluciillesiviO1E	resampling	0.0000
{classifier	: {C: 2	5.823119473	523144, 11_ratio: 0.3380	342940327316,	name: LR,
			lom_state: 79, tol: 0.0		
			ine-2, m_neighbors: 2, r	random_state: '	79, smo_grp:
OVER, ty	pe: Bord	lerlineSMOTE	L}}		

continued on the next column

TABLE S-47 "YEAST6" – CONTINUED FROM PREVIOUS COLUMN

"YEAST6" – CONTINUED FROM PREVIOUS COLUMN												
Method	Seed	Classifier	Resampler	Res.Group	GM							
Random	n 90 DT RandomOverSampler			Over	0.8925							
(1 'C	classifier: {criterion: gini, max_depth: 5, max_features: sqrt, min_samples_leaf: 4											
min_samples_split: 12, name: DTC, random_state: 90}, sub: {random_state: 90},												
	smo_grp: OVER, type: RandomOverSampler}}											
Random	109	LR	KMeansSMOTE	Over	0.892							
Kandom	107	LK	KWCansSWOTE	resampling	0.072							
{classifier	: {C:	78.831032970	50489, 11_ratio: 0.9018		, name: LR,							
penalty_so	olver: 11	+liblinear, ra	andom_state: 109, tol: (0.03178014475	286107}, sub:							
{cluster_balance_threshold: 0.039411685372900754, k_neighbors: 1, random_state: 109, smo_grp: OVER, type: KMeansSMOTE}}												
TPE	9	KNN	SVMSMOTE	Over	0.8924							
{classifier: {algorithm: ball_tree, n_neighbors: 25, name: KNN, p: 1, ra												
dom_state: 9, weights: distance}, sub: {k_neighbors: 5, m_neighbors: 6, out_step:												
0.9389332	21580420	056, random_	state: 9, smo_grp: OVER	, type: SVMSN	MOTE}}							
TPE	18	KNN	BorderlineSMOTE	Over	0.9014							
	l			resampling								
{classifier: {algorithm: kd_tree, n_neighbors: 36, name: KNN, p: 1, random_state:												
18, weights: uniform}, sub: {k_neighbors: 4, kind: borderline-1, m_neighbors: 8, random_state: 18, smo_grp: OVER, type: BorderlineSMOTE}}												
TPE	27	smo_grp: Ov LR	BorderlineSMOTE	O(E)}	0.8951							
IFE	21	LK	BoldelilleSMOTE	resampling	0.6931							
{classifier	: {C: 4	8.825676405	126735, 11_ratio: 0.289		name: LR.							
			andom_state: 27, tol: 0									
			line-2, m_neighbors: 7,									
OVER, ty	pe: Bord	lerlineSMOTI	Ξ}}									
TPE	29	KNN	SVMSMOTE	Over	0.9018							
				resampling								
			n_neighbors: 46, name:									
				m_neighbors:	6, out_step:							
TPE	36	KNN KNN	state: 29, smo_grp: OVE SVMSMOTE	Over	0.8984							
IFE	30	KININ	SYMSMOTE	resampling	0.0904							
{classifier	: {algo	rithm: kd tr	ree, n_neighbors: 20,	name: KNN.	p: 2, ran-							
			m}, sub: {k_neighbors:									
0.6357493	3779931:	562, random_	state: 36, smo_grp: OVE	R, type: SVMS	MOTE}}							
TPE	39	LR	BorderlineSMOTE	Over	0.8955							
				resampling								
			03208, 11_ratio: 0.6766									
			om_state: 39, tol: 0.									
		kına: boraer lerlineSMOTI	line-2, m_neighbors: 7,	ranuom_state:	59, SIIIO_grp:							
TPE	59	LR	KMeansSMOTE	Over	0.8956							
				resampling								
{classifier	: {C: 1	1.631020114	648761, 11_ratio: 0.700	0798419690593	, name: LR,							
penalty_so	olver: no	ne+saga, rand	om_state: 59, tol: 0.02329	9388187129833	4}, sub: {clus-							
			1446709676184, k_neig	hbors: 9, rand	om_state: 59,							
		type: KMeans										
TPE	79	KNN	BorderlineSMOTE	Over	0.9037							
[classifier	· [9]20-	ithm: beste	n naighbore: 41 nema:	resampling	random stata:							
			n_neighbors: 41, name: k_neighbors: 4, kind: b									
random st	tate: 79	smo grn: OV	ER, type: BorderlineSM	OTE}}								
TPE	90	LR	BorderlineSMOTE	Over	0.8929							
(1	L.	16.1600102		resampling								
{classifier			96571, 11_ratio: 0.1798									
	penalty_solver: 12+sag, random_state: 90, tol: 0.030474171345408103}, sub:											
{k_neighbors: 9, kind: borderline-2, m_neighbors: 7, random_state: 90, smo_grp: OVER, type: BorderlineSMOTE}}												
TPE	109	KNN	SVMSMOTE	Over	0.895							
				resampling	0.075							
			ree, n_neighbors: 47,	name: KNN,								
dom_state: 109, weights: distance}, sub: {k_neighbors: 4, m_neighbors: 4, out_step:												
0.5339218	3995926	579, random_	state: 109, smo_grp: OVI	ER, type: SVM	SMOTE}}							

TABLE S-48 "ABALONE 19"

$\label{eq:table S-48} TABLE \ S-48$ "abalone 19" — continued from previous column

Method	Seed	Classifier	Resampler	Res.Group	GM	Method	Seed	Classifier	Resampler	Res.Group	GM
Grid	9	LR	RandomUnderSampler	Under resampling	0.7677	Random	90	LR	SMOTEENN	Combine resampling	0.7956
Grid	18	LR	SMOTEENN	Combine	0.767						3255, name: LR, 31622}, sub: {ran-
Grid	27	LR	SMOTEENN	resampling Combine	0.7529				BINE, type: SMOT		1022), 546. (141.
Onu	21	LK	SWOTEENN	resampling	0.7329	Random	109	LR	SMOTE	Over	0.7931
Grid	29	LR	ClusterCentroids	Under resampling	0.7646	{classifier	{C· 3	28 558005403	591107 11 ratio	resampling 0.858567976528	9007, name: LR,
Grid	36	LR	RandomOverSampler	Over	0.7416						2940008248}, sub:
				resampling		{k_neight	oors: 7, 1	random_state:	109, smo_grp: OV	ER, type: SMOT	E}}
Grid	39	LR	ClusterCentroids	Under resampling	0.7489	TPE	9	LR	SMOTEENN	Combine resampling	0.7958
Grid	59	LR	SMOTEENN	Combine resampling	0.7668				797355, 11_ratio: m_state: 9, tol: 0		31675, name: LR, 2681}, sub: {ran-
Grid	79	LR	ClusterCentroids	Under resampling	0.7615				INE, type: SMOTE SMOTEENN		0.7973
Grid	90	LR	SMOTEENN	Combine resampling	0.7524					resampling	
Grid	109	LR	ClusterCentroids	Under	0.7556				455616, 11_ratio: m state: 18, tol: (
	9		SMOTEENN	resampling		dom_state	e: 18, sm	no_grp: COM	BINE, type: SMOT	EENN}}	,,
Random	_	LR		Combine resampling	0.7987	TPE	27	LR	SMOTEENN	Combine resampling	0.7957
			427235, 11_ratio: 0.5996							0.930424896627	1177, name: LR,
			lom_state: 9, tol: 0.09447 INE, type: SMOTEENN}		}, sub: {ran-				m_state: 27, tol: 0		14924}, sub: {ran-
Random	18	LR	SMOTEENN	Combine	0.7923				BINE, type: SMOT		0.0020
				resampling		TPE	29	LR	ClusterCentroids	resampling	0.8028
			04115, 11_ratio: 0.7421								9233, name: LR,
			dom_state: 18, tol: 0.0727		b}, sub: {ran-				m_state: 29, tol: 7.		
Random	27	LR	BINE, type: SMOTEENN SMOTETomek	Combine	0.7935		Means, r	andom_state:	29, smo_grp: UND	ER, type: Cluste	rCentroids, voting:
				resampling		hard}} TPE	36	LR	SMOTEENN	Combine	0.7956
			59886, 11_ratio: 0.7748'							resampling	
			random_state: 27, tol: 0		926442}, sub:	{classifier	r: {C: 8	37.280755585	40876, 11_ratio: (0.1814480617227	0672, name: LR,
Random_	state: 27	, smo_grp: C	OMBINE, type: SMOTET SMOTEENN	Combine	0.7923				dom_state: 36, tol:		88663}, sub: {ran-
Kandom	29	LK	SMOTEENN	resampling	0.7923			-C 1	BINE, type: SMOT	,,	0.7047
{classifier	: {C:	68.51034745	198227, 11 ratio: 0.8716		name: LR.	TPE	39	LR	SMOTEENN	Combine resampling	0.7947
			random_state: 29, tol: 0			{classifier	{C·	 95.894399312	283047 11 ratio:		6465, name: LR,
{random_	state: 29		OMBINE, type: SMOTEE	NN } }							7205027612}, sub:
Random	36	LR	ADASYN	Over	0.7939				OMBINE, type: SN		,,
{classifier	: {C:	31.4589938	 	resampling 9544067609597	7835, name:	TPE	59	LR	SMOTEENN	Combine resampling	0.7965
	lty_solv	er: 12+saga,	random_state: 36, tol: 0	0.09120679321		{classifier	:: {C:	95.387501219	907572, 11 ratio:		1599, name: LR,
			36, smo_grp: OVER, type								01313}, sub: {ran-
Random	39	LR	SMOTEENN	Combine	0.7918	dom_state	e: 59, sm	no_grp: COM	BINE, type: SMOT	EENN}}	,,
			 36818, 11_ratio: 0.53091			TPE	79	LR	SMOTEENN	Combine resampling	0.795
			dom_state: 39, tol: 0.0925		2}, sub: {ran-	{classifier	: {C: 3	38.173437615	28682, 11_ratio: (0.1708596015721	3426, name: LR,
			BINE, type: SMOTEENN		0.5050	penalty_s	olver: el	asticnet+saga,	random_state: 79	, tol: 0.0712503	3972192531}, sub:
Random	59	LR	SMOTEENN	Combine resampling	0.7958	{random_ TPE	state: 79	o, smo_grp: C	OMBINE, type: SM SMOTEENN	MOTEENN } } Combine	0.7967
			54713, 11_ratio: 0.7596, random state: 59, tol:				1			resampling	
			OMBINE, type: SMOTEE		20020 j, sub.						26772, name: LR,
Random	79	LR	SMOTETomek	Combine	0.7944	dom_state	e: 90, sm	no_grp: COM	m_state: 90, tol: (BINE, type: SMOT		,,
[classifier	. (C. 5	3 005065966	 039425, 11_ratio: 0.6268	resampling	nama: I D	TPE	109	LR	SMOTEENN	Combine	0.7968
			o39425, 11_ratio: 0.6268 random_state: 79, tol: 0			(1 :0	1	70.140000050	102070 11	resampling	1022
			OMBINE, type: SMOTET		.55625j, Sub.						4933, name: LR, 9880141663}, sub:
				nued on the	next column				COMBINE, type: S		>0001+1003}, Sub:
						[Tandonii_	state. 10	,,, sino_gip. v	combine, type. s	MICIEL MITT	

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