

AGENDA

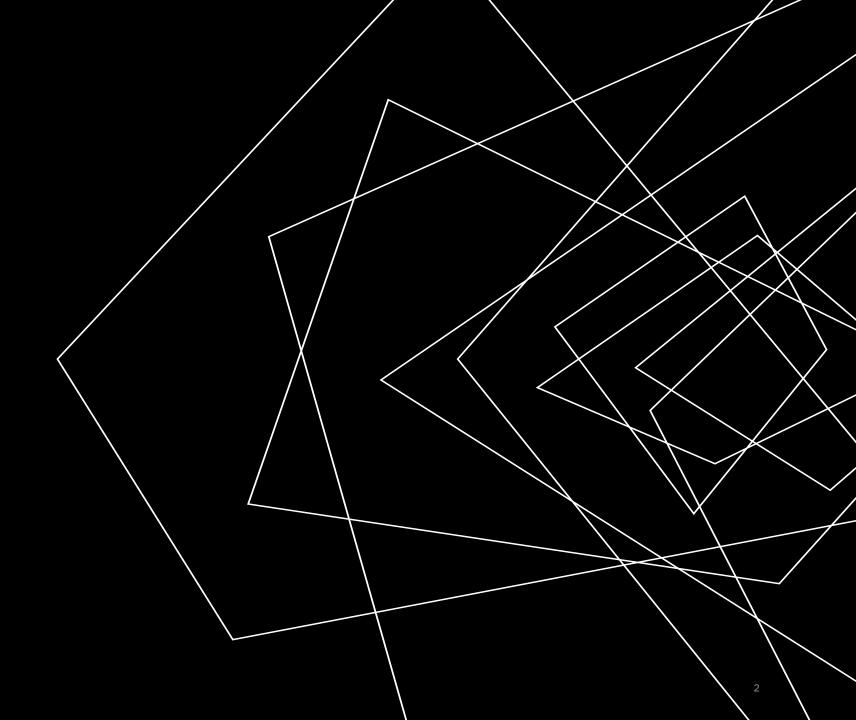
Overview

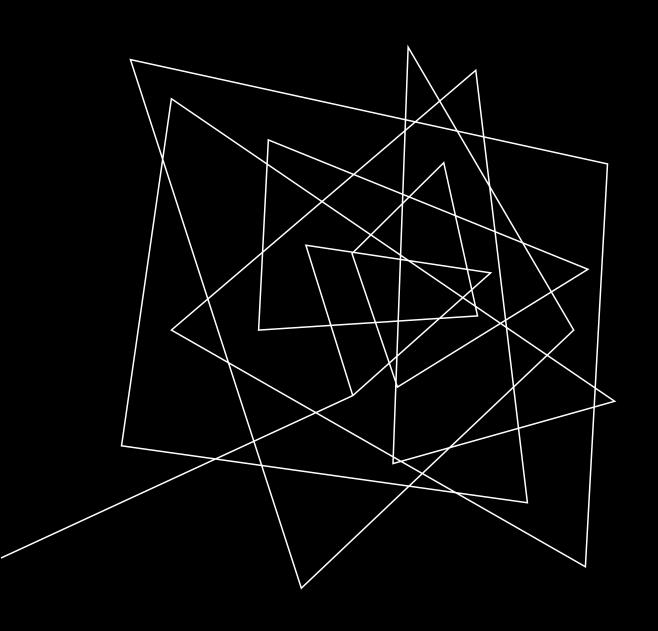
Methods Stability

Methods Time Complexity

Models Tunability

Conclusions





OVERVIEW

OVERVIEW

- 5 avionic-related datasets for binary classification, limited to 10k samples with basic preprocessing
- Optimization methods: GridSearch, BayesSearch
- CV = 3

XGBOOST

XGBoost Parameter Grid

 n_estimators:
 100, 300, 500, 1000

 learning_rate:
 0.01, 0.05, 0.1

 max_depth:
 10, 15, 20

 min_child_weight:
 1, 2, 5, 10

 gamma:
 0, 0.15, 0.3

 eval_metric:
 "logloss", "error", "auc"

 random state:
 42

LOGISTIC REGRESSION

Logistic Regression Parameter Grid

C: np.logspace(-4, 4, 10)

max_iter: 50, 100, 200, 300, 500, 1000

tol: 1e-3, 1e-4, 1e-5, 1e-6

fit intercept: True, False

class weight: None, "balanced"

random_state: 42

max iter: 500

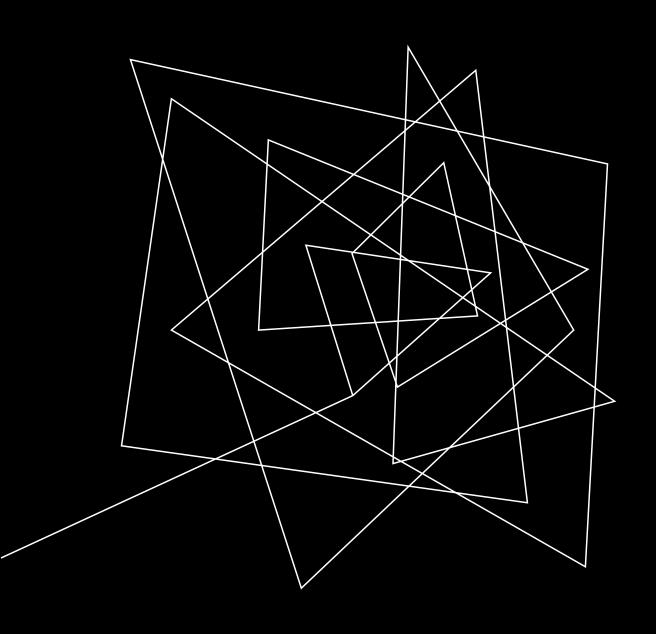
KNN

KNN Parameter Grid

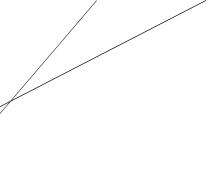
n_neighbors: 3, 5, 7, 9, 11, 15, 30, 50
weights: "uniform", "distance"
algorithm: "auto", "ball tree", "kd tree", "brute"

metric: "euclidean", "manhattan", "minkowski", "chebyshev"

leaf_size: 20, 30, 40, 50

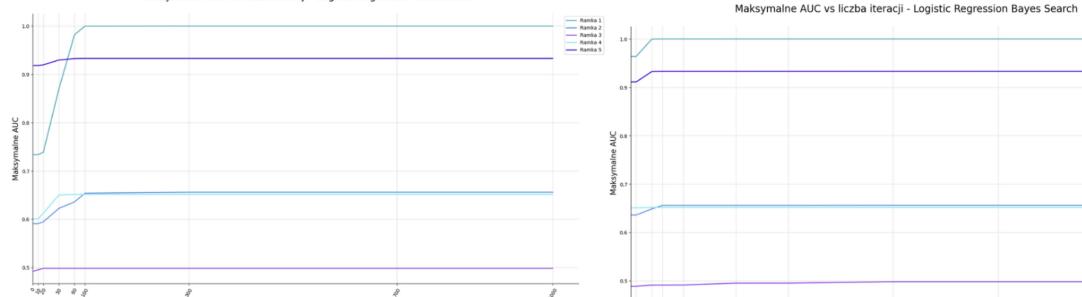


METHODS STABILITY



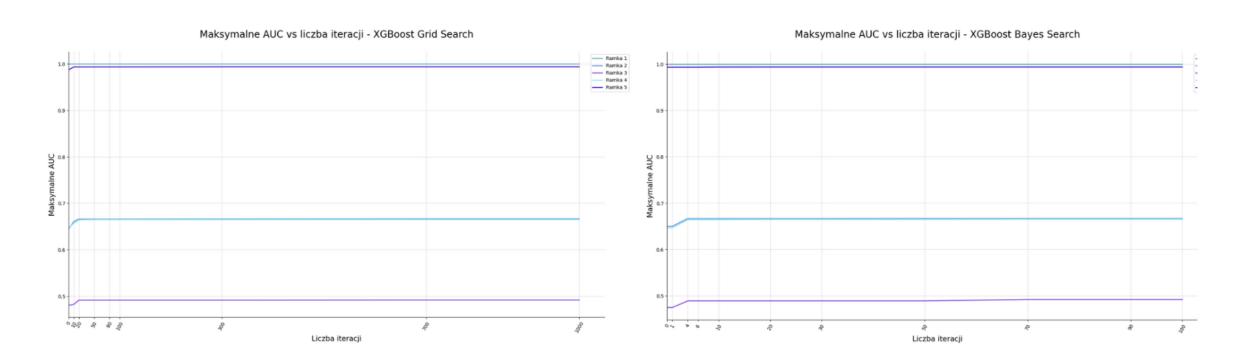
Maksymalne AUC vs liczba iteracji - Logistic Regression Grid Search

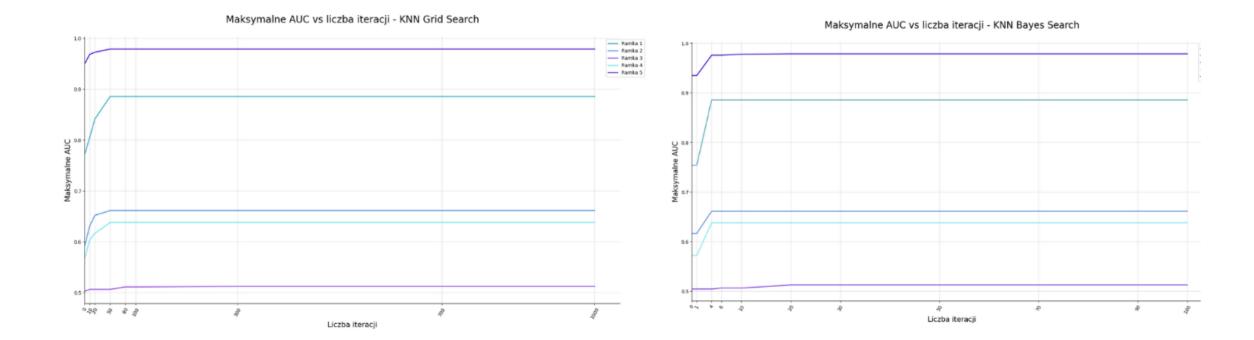
Liczba iteracji

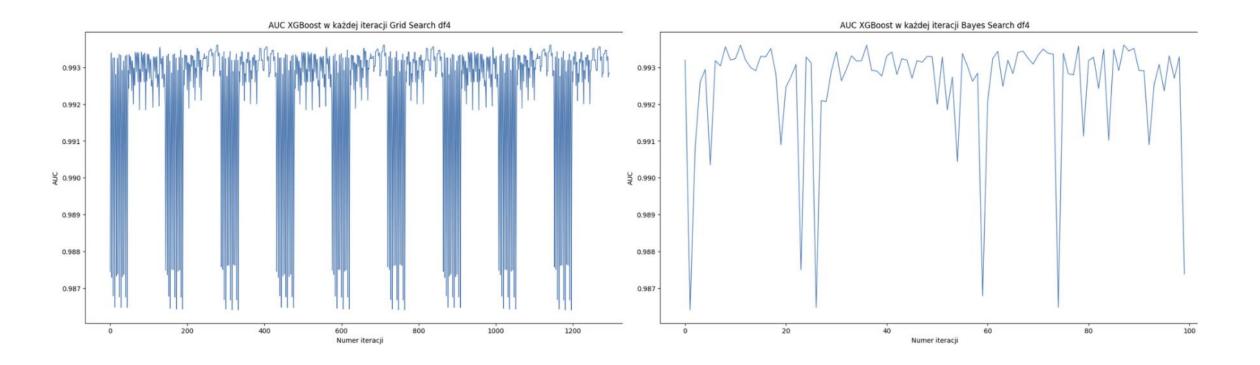


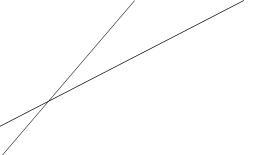


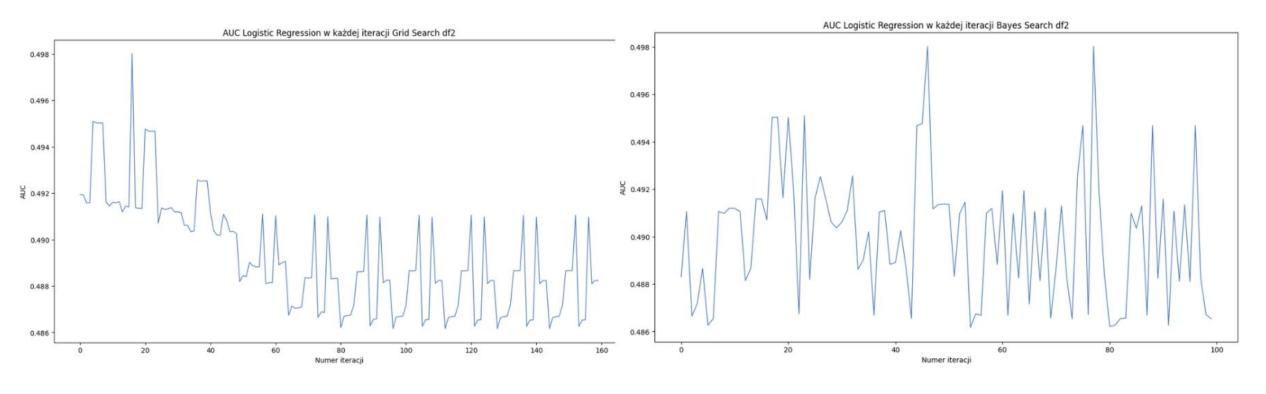
Liczba iteracji

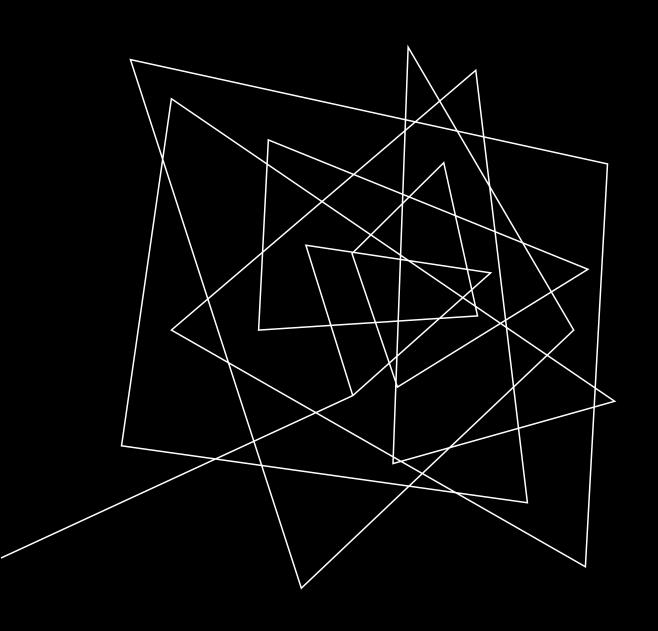






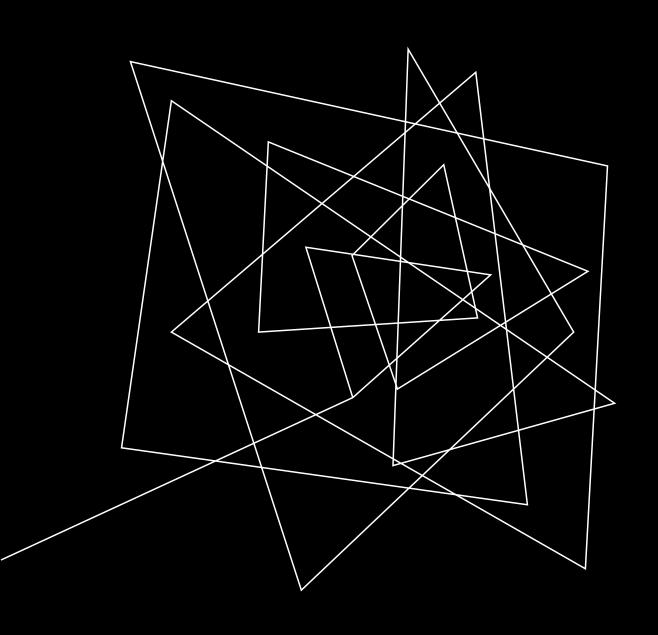




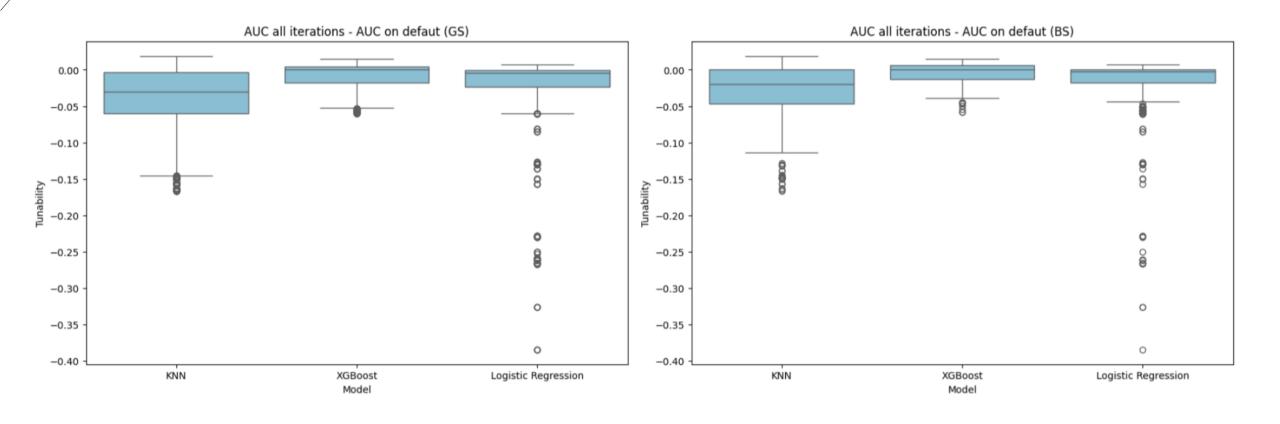


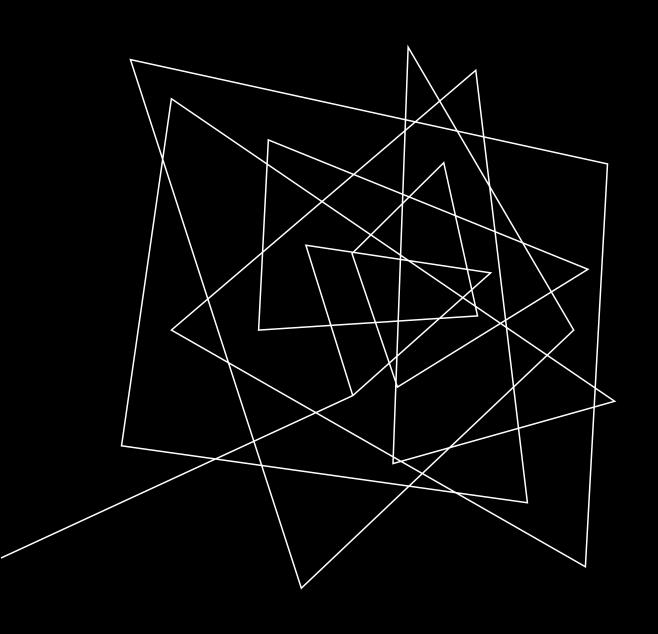
METHODS TIME COMPLEXITY

Model	Search Method	Dataset	Iterations	Time	Avg It Time
KNN	Bayes Search	1	100	207.470	2.070
KNN	Grid Search	1	1024	119.660	0.120
KNN	Bayes Search	2	100	240.060	2.400
KNN	Grid Search	2	1024	175.210	0.170
KNN	Bayes Search	3	100	232.420	2.320
KNN	Grid Search	3	1024	66.700	0.070
KNN	Bayes Search	4	100	274.810	2.750
KNN	Grid Search	4	1024	480.140	0.470
KNN	Bayes Search	5	100	228.410	2.280
KNN	Grid Search	5	1024	203.230	0.200
LR	Bayes Search	1	100	210.940	2.110
LR	Grid Search	1	160	3.200	0.020
LR	Bayes Search	2	100	233.240	2.330
LR	Grid Search	2	160	1.530	0.010
LR	Bayes Search	3	100	206.840	2.070
LR	Grid Search	3	160	0.860	0.010
LR	Bayes Search	4	100	233.010	2.330
LR	Grid Search	4	160	9.510	0.060
LR	Bayes Search	5	100	208.490	2.080
LR	Grid Search	5	160	1.410	0.010
XGBoost	Bayes Search	1	100	152.680	1.530
XGBoost	Grid Search	1	1296	76.890	0.060
XGBoost	Bayes Search	2	100	258.110	2.580
XGBoost	Grid Search	2	1296	584.910	0.450
XGBoost	Bayes Search	3	100	269.510	2.700
XGBoost	Grid Search	3	1296	472.370	0.360
XGBoost	Bayes Search	4	100	395.650	3.960
XGBoost	Grid Search	4	1296	1929.640	1.490
XGBoost	Bayes Search	5	100	242.160	2.420
XGBoost	Grid Search	5	1296	301.170	0.230



MODELS TUNABILITY





TANKS FOR ATTENTION