1. Supplementary materials

1.1. Hyperparameters of Models

1.1.1. Logistic regression

Parameters	**Values**
solver	newton-cg
penalty	none
the others	default in scikit-learn package

1.1.2. Artificial neural network

Parameters	**Values**
hidden_layer_sizes	(64, 64)
batch_size	64
learning_rate_init	0.001
the others	default in scikit-learn package

1.1.3. Support vector machine

Parameters	**Values**
kernel	poly
degree	4
the others	default in scikit-learn package

1.1.4. Decision tree

Parameters	**Values**
criterion	gini
max_depth	7
min_samples_split	5
min_samples_leaf	0.05
the others	default in scikit-learn package

1.1.5. Bagging

Parameters	**Values**
max_features	0.5
max_samples	1
n_estimators	660
the others	default in scikit-learn package

1.1.6. AdaBoost

Parameters	**Values**
n_estimators	200
learning_rate	0.1
the others	default in scikit-learn package

1.1.7. Random forest

Parameters	**Values**
n_estimators	180
max_depth	16
min_samples_split	5
min_samples_leaf	1
max_features	3
the others	default in scikit-learn package

1.1.8. Gradient boosting decision tree

Parameters	**Values**
n_estimators	1500
learning_rate	0.01
max_depth	11
min_samples_split	10
min_samples_leaf	2
max_features	8
the others	default in scikit-learn package

1.1.9. XGBoost-TPE

In the column of TPE search space, the first two numbers in the round brackets indicate the lower and upper bounds of the taken values, and the third number indicates the spacing value. The values in square brackets directly indicate the candidate values.

Parameters	**TPE search space**	**Values**
n_estimators	(100, 1000, 100)	700
learning_rate	[0.005, 0.01, 0.02]	0.01
max_depth	(4, 10, 1)	10
colsample_bytree	(0.6, 1.0, 0.1)	0.9
subsample	(0.6, 1.0, 0.1)	0.6
gamma	(0.1, 0.4, 0.1)	0.3
reg_alpha	[0, 0.01, 0.1, 1]	0.01
reg_lambda	[0, 0.01, 0.1, 1]	1
the others	default in XGBoost package	default in XGBoost package

1.1.10. XGBoost

Parameters	**Values**
n_estimators	900
learning_rate	0.01
max_depth	9
colsample_bytree	0.5
subsample	0.8
gamma	0.2
reg_alpha	0.01
reg_lambda	1
the others	default in XGBoost package

1.1.11. LightGBM

Parameters	**Values**
n_estimators	700
learning_rate	0.01
max_depth	7
num_leaves	50
max_bin	100
min_child_samples	30
min_child_weight	0.001
colsample_bytree	0.8
subsample	0.8
reg_alpha	1
reg_lambda	0.7
the others	default in LightGBM package