

Róża Mazurek 280508

Metody Systemowe i Decyzyjne

## RAPORT Z II CZĘŚCI PROJEKTU

### 1. Model klasyfikujący- 6th Stage

Model	Numeric Stantalyzer	Cathegical Estimator	Train Accuracy	Validation Accuracy	Test Accuracy
LogisticRegression	StandardScaler	OrdinalEncoder	0.924716	0.917219	0.908940
LogisticRegression	StandardScaler	OneHotEncoder	0.951705	0.918874	0.951987
LogisticRegression	MinMaxScaler	OrdinalEncoder	0.835582	0.841060	0.834437
LogisticRegression	MinMaxScaler	OneHotEncoder	0.848011	0.836093	0.844371
ExtraTreesClassifier	StandardScaler	OrdinalEncoder	0.993253	0.958609	0.961921
ExtraTreesClassifier	StandardScaler	OneHotEncoder	0.993253	0.947020	0.958609
ExtraTreesClassifier	MinMaxScaler	OrdinalEncoder	0.993253	0.960265	0.963576
ExtraTreesClassifier	MinMaxScaler	OneHotEncoder	0.993253	0.947020	0.961921
RandomForestClassifier	StandardScaler	OrdinalEncoder	0.993253	0.973510	0.968543
RandomForestClassifier	StandardScaler	OneHotEncoder	0.993253	0.968543	0.968543
RandomForestClassifier	MinMaxScaler	OrdinalEncoder	0.993253	0.971854	0.966887
RandomForestClassifier	MinMaxScaler	OneHotEncoder	0.993253	0.971854	0.968543
SVC	StandardScaler	OrdinalEncoder	0.952770	0.918874	0.945364
SVC	StandardScaler	OneHotEncoder	0.952415	0.917219	0.947020
SVC	MinMaxScaler	OrdinalEncoder	0.791903	0.779801	0.788079
SVC	MinMaxScaler	OneHotEncoder	0.788707	0.779801	0.776490

Model	Numeric Stantalyzer	Cathegical Estimator	Train Presision	Validation Precision	Test Precision	Train F1	Validation F1	Test F1
LogisticRegression	StandardScaler	OrdinalEncoder	0.924246	0.916233	0.908778	0.924144	0.916010	0.908292
LogisticRegression	StandardScaler	OneHotEncoder	0.951619	0.921261	0.953253	0.951235	0.917509	0.951611
LogisticRegression	MinMaxScaler	OrdinalEncoder	0.834014	0.841226	0.835202	0.829321	0.833863	0.828827
LogisticRegression	MinMaxScaler	OneHotEncoder	0.852229	0.846900	0.857876	0.835893	0.822036	0.833588
ExtraTreesClassifier	StandardScaler	OrdinalEncoder	0.993318	0.958592	0.962831	0.993256	0.958526	0.961934
ExtraTreesClassifier	StandardScaler	OneHotEncoder	0.993318	0.946745	0.959488	0.993256	0.946853	0.958519
ExtraTreesClassifier	MinMaxScaler	OrdinalEncoder	0.993318	0.960315	0.964635	0.993256	0.960219	0.963627
ExtraTreesClassifier	MinMaxScaler	OneHotEncoder	0.993318	0.947055	0.962992	0.993256	0.946708	0.961923
RandomForestClassifier	StandardScaler	OrdinalEncoder	0.993349	0.973696	0.969304	0.993266	0.973479	0.968606
RandomForestClassifier	StandardScaler	OneHotEncoder	0.993351	0.968641	0.969304	0.993262	0.968509	0.968606
RandomForestClassifier	MinMaxScaler	OrdinalEncoder	0.993329	0.972020	0.967793	0.993260	0.971838	0.966964
RandomForestClassifier	MinMaxScaler	OneHotEncoder	0.993351	0.972020	0.969304	0.993262	0.971838	0.968606
SVC	StandardScaler	OrdinalEncoder	0.952753	0.920284	0.946623	0.952228	0.917326	0.944611
SVC	StandardScaler	OneHotEncoder	0.952252	0.917759	0.947863	0.951882	0.915494	0.946351
SVC	MinMaxScaler	OrdinalEncoder	0.809728	0.812774	0.817686	0.766831	0.754042	0.764999
SVC	MinMaxScaler	OneHotEncoder	0.806942	0.812615	0.800417	0.762990	0.753317	0.750787

## 2. Model regresyjny-Tumor Size

Model	Numeric Stantalyzer	Cathegorical Estimator	Train MEA	Validation MEA	Test MEA	Train MSE	Validation MSE	Test MSE
GradientBoostingRegressor	StandardScaler	OrdinalEncoder	6.150733	7.338645	7.307256	77.596688	134.561592	139.436356
GradientBoostingRegressor	StandardScaler	OneHotEncoder	6.130323	7.464407	7.485048	75.961649	139.548415	0.821034
GradientBoostingRegressor	MinMaxScaler	OrdinalEncoder	6.150733	7.390645	7.310399	77.596688	137.814142	139.461400
GradientBoostingRegressor	MinMaxScaler	OneHotEncoder	6.130323	7.490173	7.483242	75.961649	140.993251	148.940853
SVR	StandardScaler	OrdinalEncoder	7.629734	8.149180	8.139342	155.045206	184.195525	195.390298
SVR	StandardScaler	OneHotEncoder	7.692291	8.582371	8.471811	164.439303	216.288506	232.410854
SVR	MinMaxScaler	OrdinalEncoder	7.090107	7.551871	7.380677	132.796880	159.139418	157.800642
SVR	MinMaxScaler	OneHotEncoder	6.967910	7.623537	7.562595	129.804523	175.891128	186.276883
RandomForestRegressor	StandardScaler	OrdinalEncoder	2.636058	7.617152	7.555596	16.141872	136.833535	144.280862
RandomForestRegressor	StandardScaler	OneHotEncoder	2.631697	7.649321	7.547318	15.677838	138.973955	144.036177
RandomForestRegressor	MinMaxScaler	OrdinalEncoder	2.642628	7.651854	7.587169	15.538164	141.041746	147.118274
RandomForestRegressor	MinMaxScaler	OneHotEncoder	2.616175	7.657285	7.515778	15.538164	139.272831	144.728045

Model	Numeric Stantalyzer	Cathegorical Estimator	Train $R^2$	Validation $R^2$	Test $R^2$
GradientBoostingRegressor	StandardScaler	OrdinalEncoder	0.817181	0.721329	0.725347
GradientBoostingRegressor	StandardScaler	OneHotEncoder	0.821034	0.711002	0.706425
GradientBoostingRegressor	MinMaxScaler	OrdinalEncoder	0.817181	0.71459	0.725298
GradientBoostingRegressor	MinMaxScaler	OneHotEncoder	0.821034	0.708010	0.706626
SVR	StandardScaler	OrdinalEncoder	0.634712	0.618540	0.615132
SVR	StandardScaler	OneHotEncoder	0.612579	0.552077	0.542212
SVR	MinMaxScaler	OrdinalEncoder	0.687129	0.670430	0.689174
SVR	MinMaxScaler	OneHotEncoder	0.694179	0.635738	0.633083
RandomForestRegressor	StandardScaler	OrdinalEncoder	0.961970	0.716624	0.715805
RandomForestRegressor	StandardScaler	OneHotEncoder	0.963063	0.712192	0.716287
RandomForestRegressor	MinMaxScaler	OrdinalEncoder	0.963509	0.707909	0.710216
RandomForestRegressor	MinMaxScaler	OneHotEncoder	0.963392	0.711573	0.714924

## 3. Regresja liniowa do określenia Tumor Size z zamkniętą formułą

Train $R^2$	Train MEA	Train MSE	Validation $R^2$	Validation MEA	Validation MSE	Test $R^2$	Test MEA	Test MSE
0.772290	6.718522	96.650375	0.733229	7.342680	128.815210	0.733818	7.261547	135.135471

## 4. Gradient Descent do określenia Tumor Size

Parametry:

Learning rate = 0,01

Epochs=500

### Batch\_size=64

Train $R^2$	Train MEA	Train MSE	Test $R^2$	Test MEA	Test MSE
0.771751	6.717444	96.879081	0.731180	7.274846	136.474717

Wyniki na zestawu walidacyjnym były liczone co 100 epochów:

Oto kilka wyników:

Epoch 0: Train cost: 189.1495, Validation cost: 217.0349, R2: 0.1011

Epoch 100: Train cost: 49.7632, Validation cost: 65.0945, R2: 0.7304

Epoch 200: Train cost: 48.7977, Validation cost: 63.3544, R2: 0.7376

Epoch 300: Train cost: 48.5810, Validation cost: 63.2706, R2: 0.7379

Epoch 400: Train cost: 48.4867, Validation cost: 63.2344, R2: 0.7381