

FIG. 1: (a) Best combinations of models and feature selection strategies that performed best for at least one of the time series or error function, all data sets (252 cases). (b) Ratio of best forecasts that outperform baseline among six data sets, given for each combination of error function versus time series.

Results of feature selection experiment. Parameters:

```
%Models:
nameModel = {'VAR', 'MSVR', 'Random Forest', 'Neural network'}; % Set of models.
handleModel = {@VarForecast, @MLSSVRMethod, @TreeBaggerForecast, @NnForecast};
pars = cell(1, numel(nameModel));
pars{1} = struct('regCoeff', 2);
pars{2} = struct('kernel_type', 'rbf', 'p1', 2, 'p2', 0, 'gamma', 0.5, 'lambda', 4);
pars{3} = struct('nTrees', 25, 'nVars', 48);
pars{4} = struct('nHiddenLayers', 25);

%Generating extra features:
generator_names = {'SSA', 'Cubic', 'Conv', 'Centroids', 'NW'};

%Feature selection:
fs_names = {'PCA', 'NPCA'};

N_PREDICTIONS = 1;
TRAIN_TEST_VAL_RATIO = [0.75, 0.25];
```

Splitting into train and test was performed only once. The table 1 presents single best result (in terms of test SMAPE) for each time series, original and missing values data sets.

Data	Energy	Max T.	Min T.	Precipitation	Wind	Humidity	Solar
orig	0.111	0.127	0.111	1.222	0.396	0.201	0.495
0.01	0.230	0.185	0.129	1.028	0.397	0.254	0.577
0.03	0.231	0.191	0.137	1.026	0.396	0.253	0.591
0.05	0.230	0.200	0.141	1.017	0.390	0.250	0.592
0.1	0.247	0.198	0.151	1.192	0.381	0.225	0.562
varying	0.124	0.139	0.102	1.232	0.395	0.219	0.489

Таблица 1: Best results obtained for each dataset (testSMAPE).

Data	Energy	Max T.	Min T.	Precipitation	Wind	Humidity	Solar
orig	0.031	0.073	0.057	0.848	0.111	0.051	0.267
0.01	0.034	0.055	0.040	0.595	0.111	0.055	0.253
0.03	0.034	0.057	0.042	0.595	0.110	0.055	0.249
0.05	0.034	0.060	0.043	0.592	0.109	0.054	0.246
0.1	0.031	0.081	0.063	0.743	0.102	0.051	0.272
varying	0.027	0.057	0.044	0.888	0.112	0.055	0.272

Таблица 2: Best results obtained for each dataset (trainSMAPE).

Data	Energy	Max T.	Min T.	Precipitation	Wind	Humidity	Solar
orig	0.001	0.000	0.000	0.001	0.002	0.001	0.000
0.01	0.000	0.005	0.001	0.003	0.000	0.000	0.009
0.03	0.001	0.004	0.002	0.001	0.001	0.000	0.001
0.05	0.001	0.004	0.000	0.000	0.001	0.001	0.018
0.1	0.001	0.002	0.000	0.004	0.000	0.001	0.001
varying	0.001	0.001	0.001	0.004	0.003	0.000	0.001

Таблица 3: testRes

Data	Energy	Max T.	Min T.	Precipitation	Wind	Humidity	Solar
orig	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.01	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.03	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.05	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.1	0.000	0.000	0.000	0.000	0.000	0.000	0.000
varying	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Таблица 4: trainRes

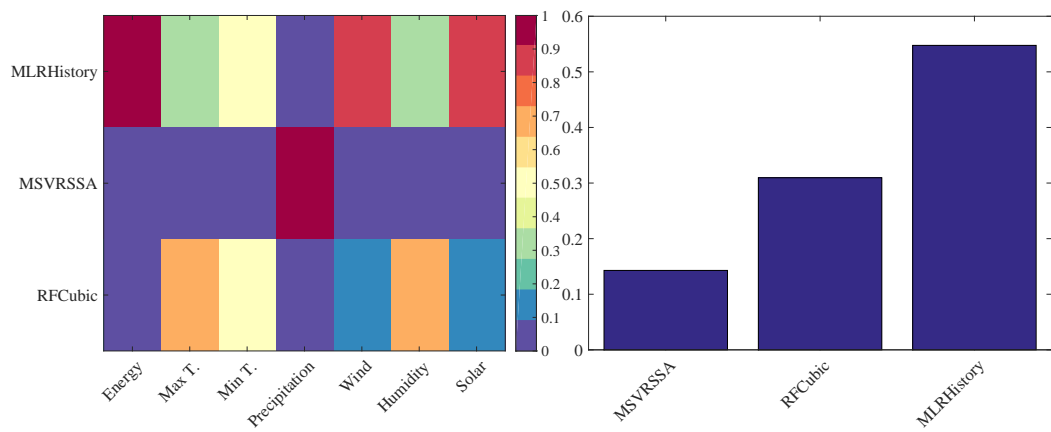
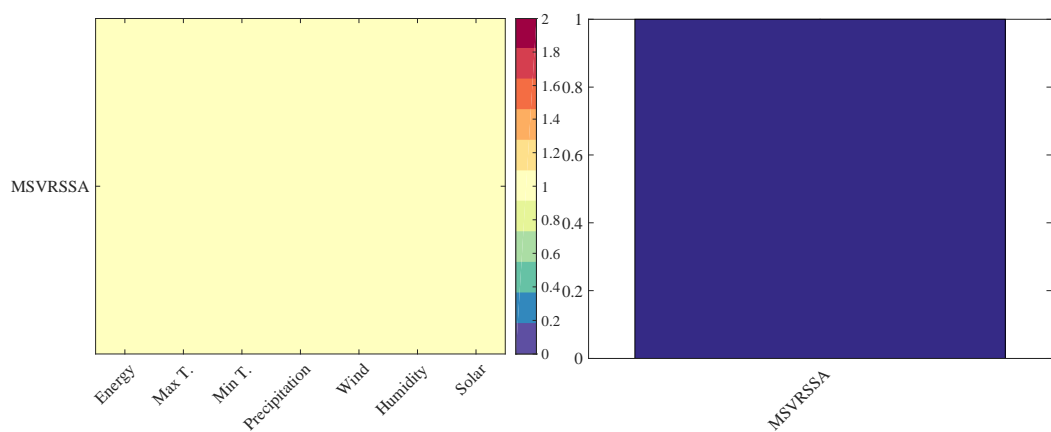
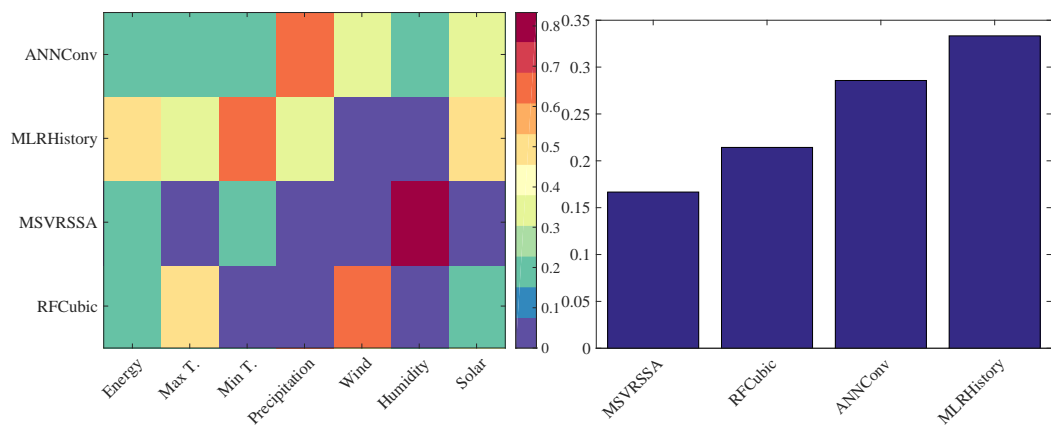
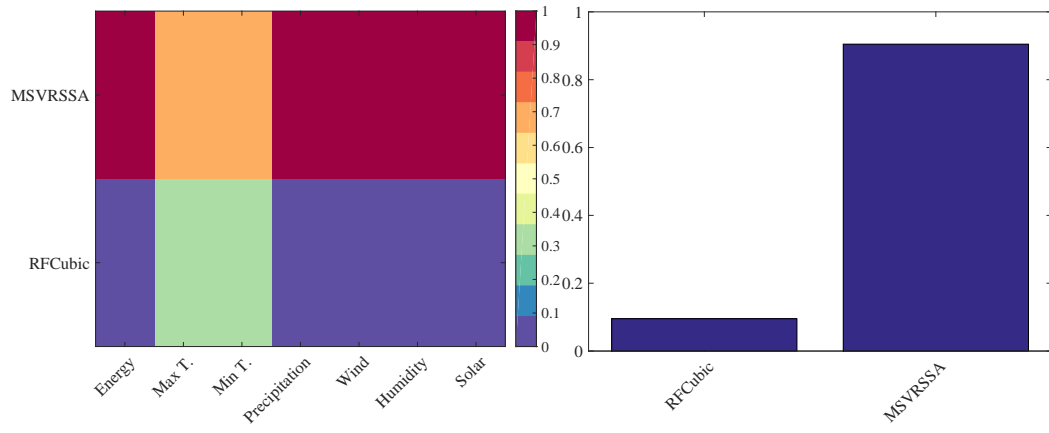
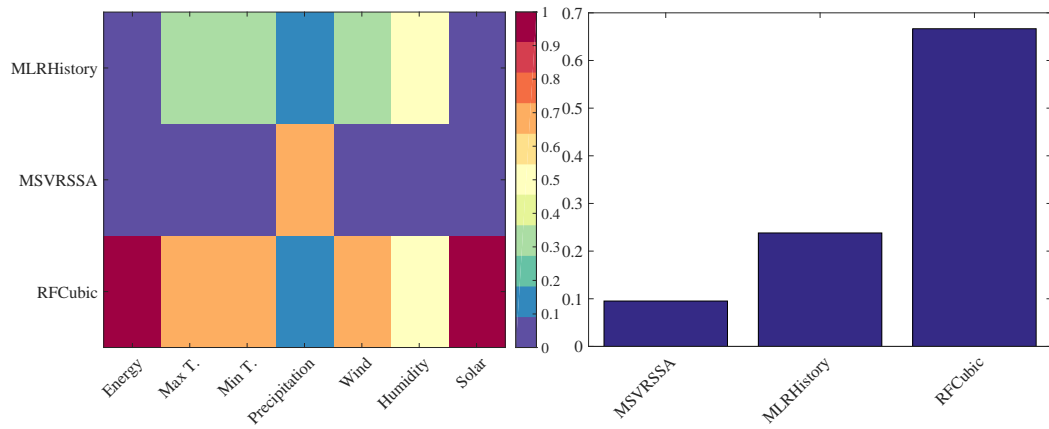


Рис. 2: Best performing models.



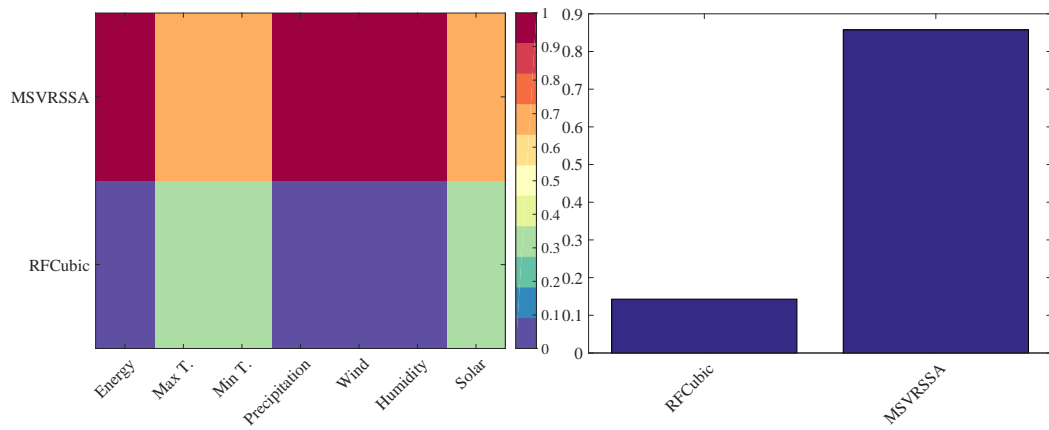
(a) trainResStd

(b) trainResStd



(c) testSMAPE

(d) testSMAPE



(e) trainSMAPE

(f) trainSMAPE

Рис. 3: Best performing models.

Data	Energy	Max T.	Min T.	Precipitation	Wind	Humidity	Solar
orig	0.063	0.070	0.069	0.109	0.154	0.138	0.146
0.01	0.123	0.105	0.086	0.094	0.149	0.166	0.168
0.03	0.123	0.107	0.092	0.093	0.150	0.166	0.171
0.05	0.122	0.112	0.095	0.090	0.148	0.171	0.174
0.1	0.134	0.105	0.099	0.105	0.152	0.156	0.176
varying	0.068	0.071	0.066	0.117	0.149	0.142	0.151

Таблица 5: testStdRes

Data	Energy	Max T.	Min T.	Precipitation	Wind	Humidity	Solar
orig	0.013	0.038	0.038	0.029	0.034	0.034	0.062
0.01	0.017	0.034	0.028	0.025	0.031	0.035	0.056
0.03	0.017	0.034	0.028	0.025	0.031	0.035	0.055
0.05	0.017	0.034	0.029	0.025	0.031	0.035	0.055
0.1	0.016	0.038	0.037	0.026	0.031	0.034	0.056
varying	0.013	0.036	0.031	0.031	0.031	0.036	0.061

Таблица 6: trainResStd