AI FOR THE INDUSTRY 4.0

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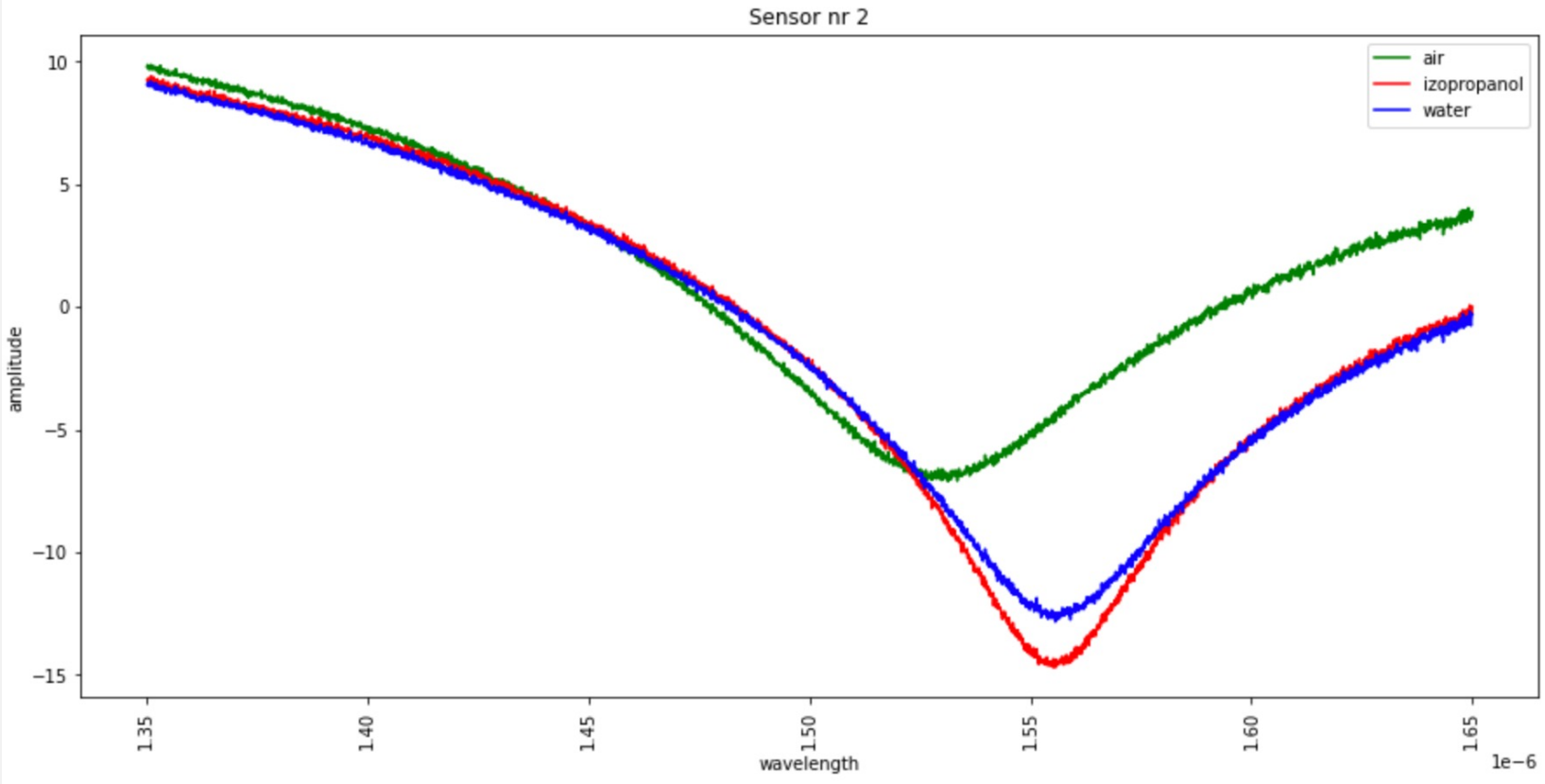
DATASET

Collection of measurements based on 10 sensors in three reference substances:

- Air
- Water
- Isopropanol

Dataset contains two-dimensional signal (signal wavelength, signal amplitude)



PREPERING DATA TO MODELING

Train/test split

- Random choice sensors to training set (8) and testing set (2)

StandardScaler

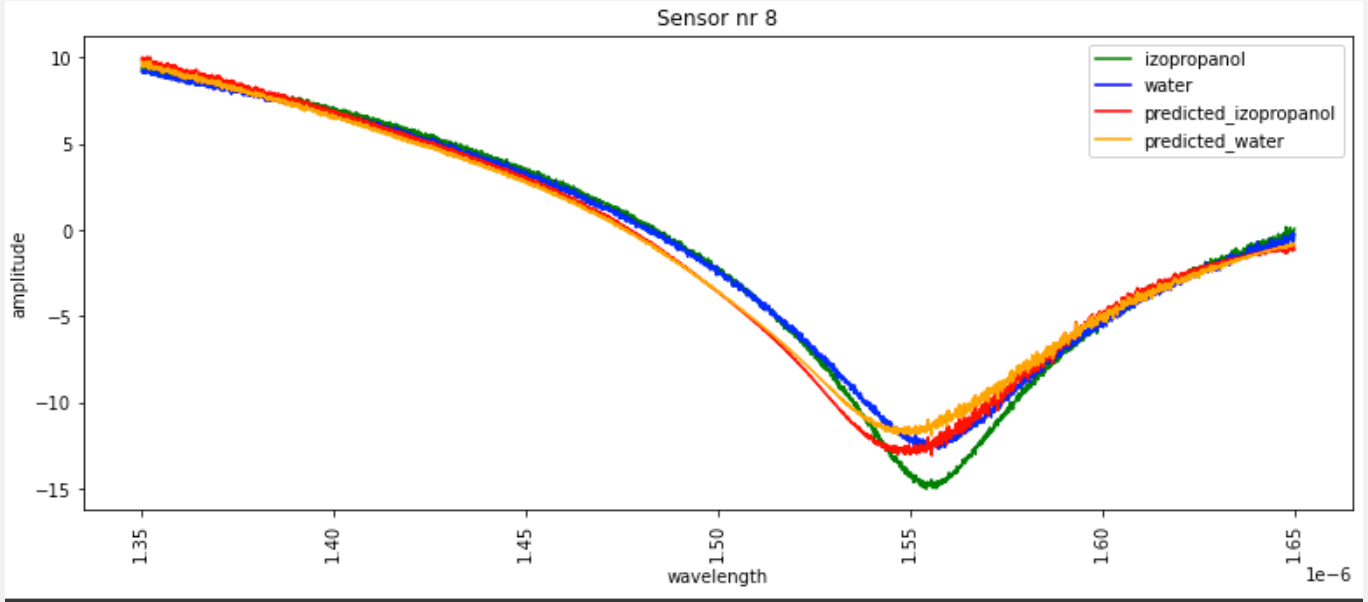
PolynomialFeatures

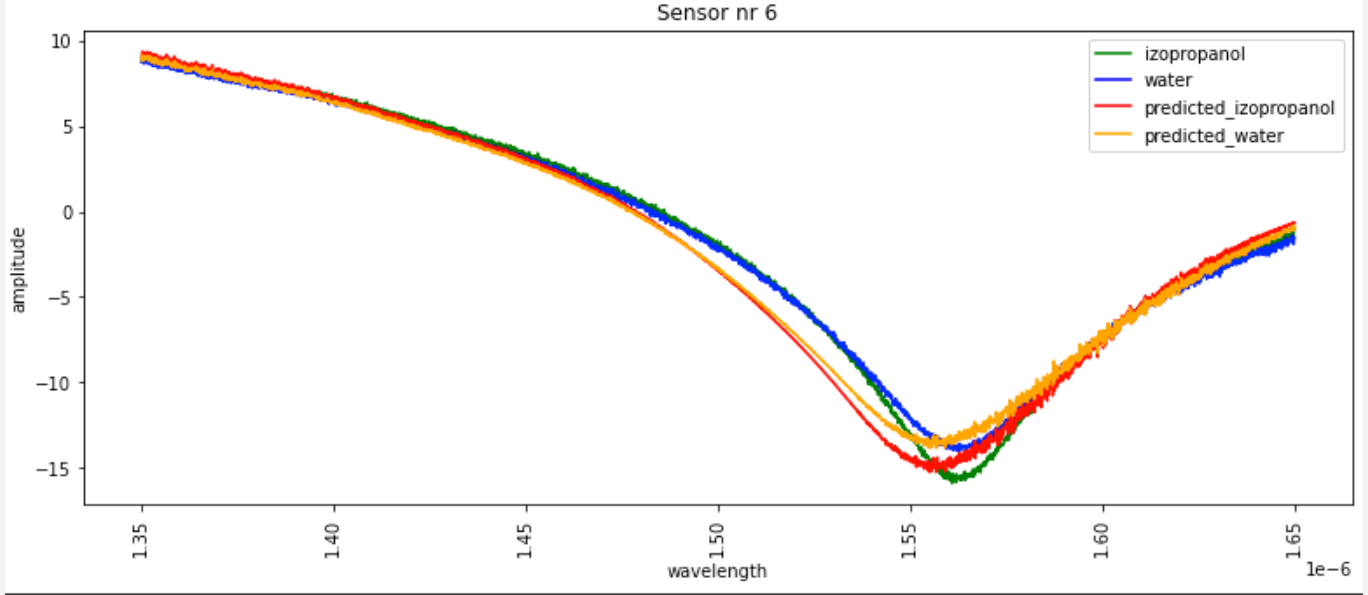
- Degree = 3
- for LinearRegression and MultiTaskElasticNetCV

MODELS USED AND RESULTS

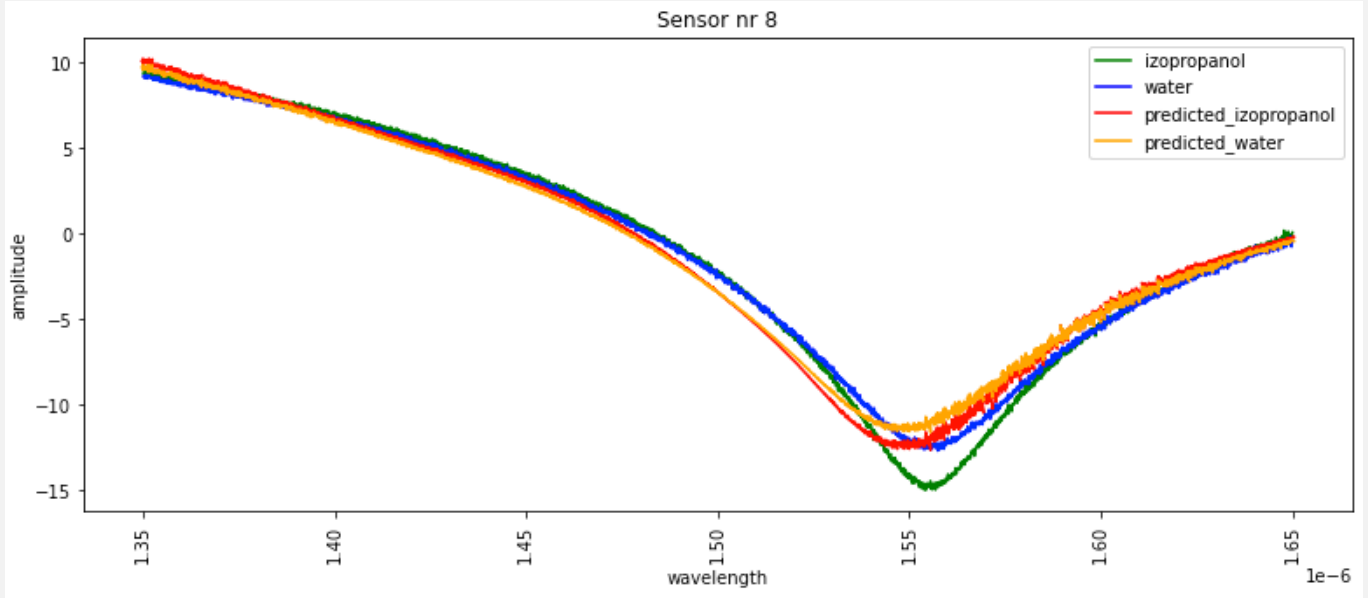
	model	r2_1	r2_2	MSE_1	MSE_2
0	LinearRegression()	0.993280	0.992609	0.299238	0.373723
1	MultiTaskElasticNetCV(cv=10, l1_ratio=0.9, ran...	0.991527	0.992195	0.368618	0.391338
2	(DecisionTreeRegressor(max_depth=80, max_featu...	0.996865	0.994711	0.135641	0.263686
3	KNeighborsRegressor()	0.997428	0.994728	0.111908	0.265303

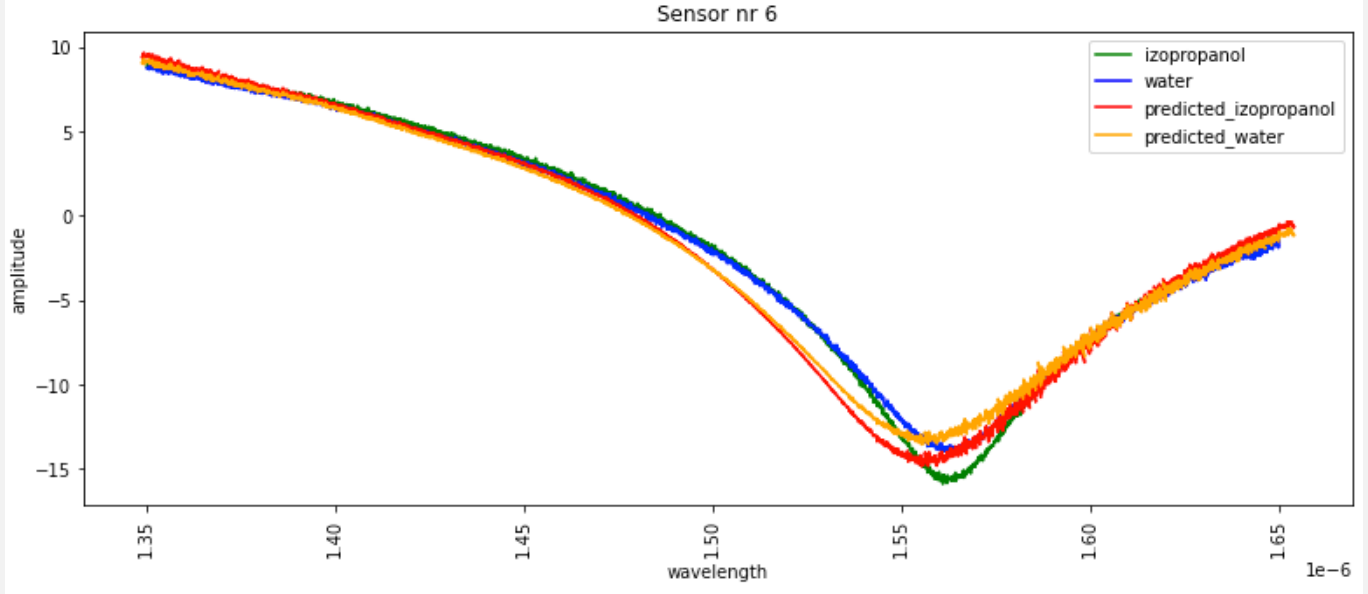
LINEAR REGRESSION



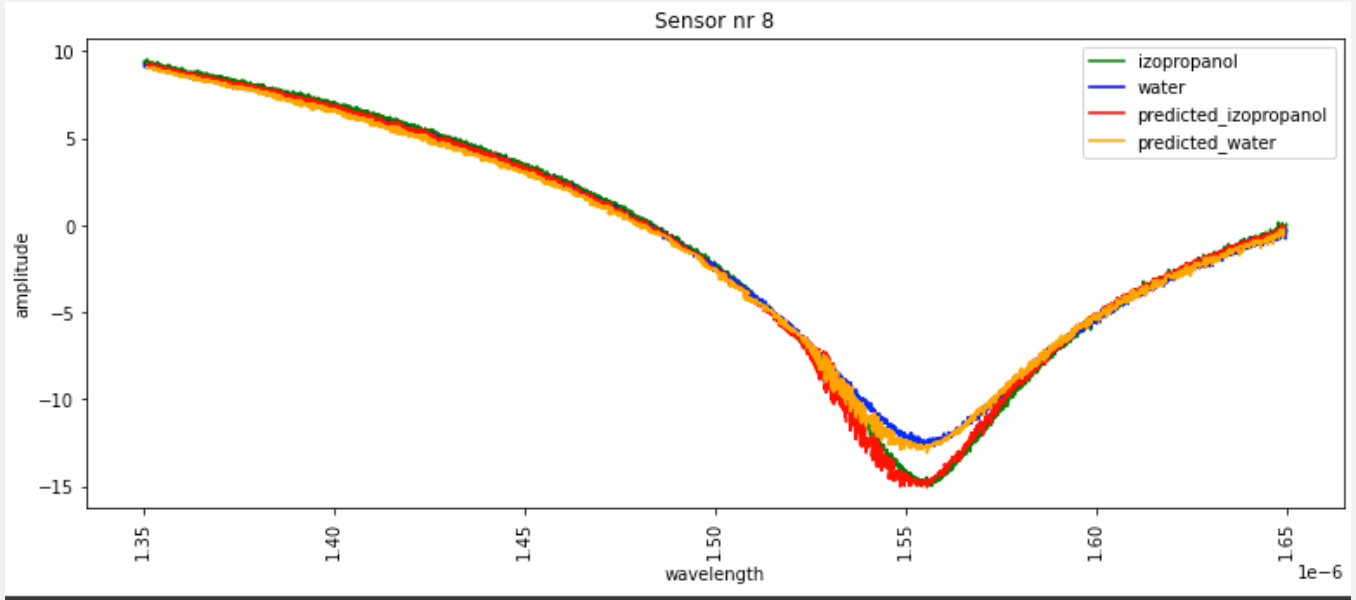


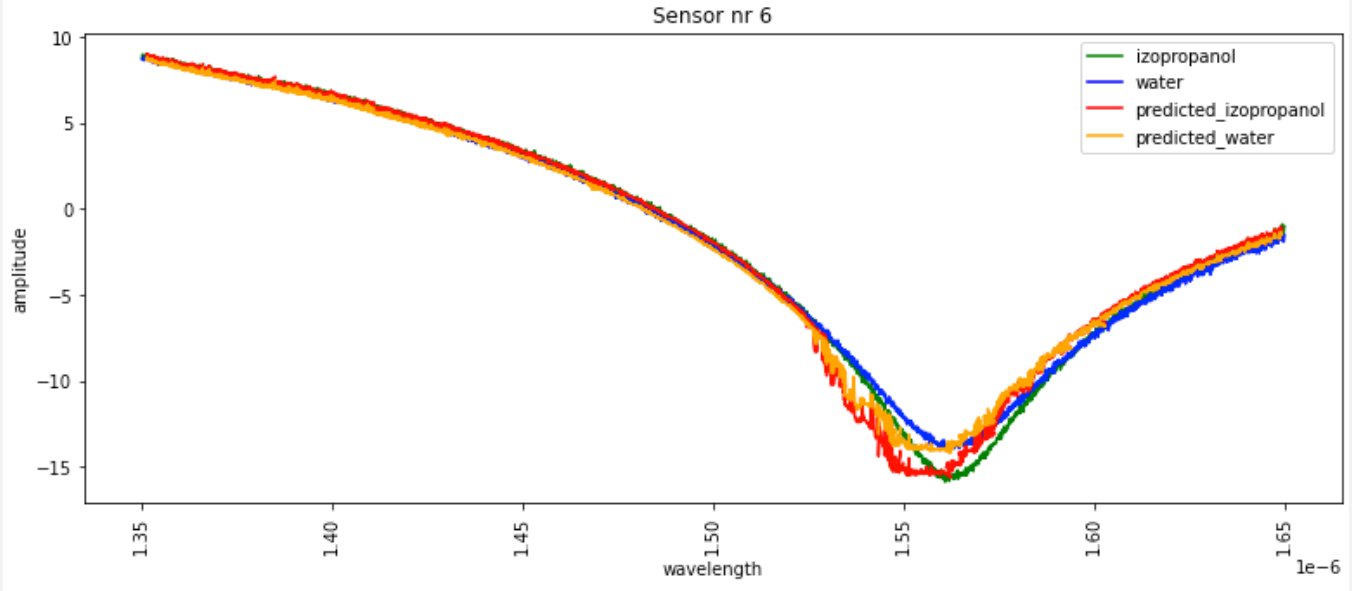
MULTITASKELASTICNETCV



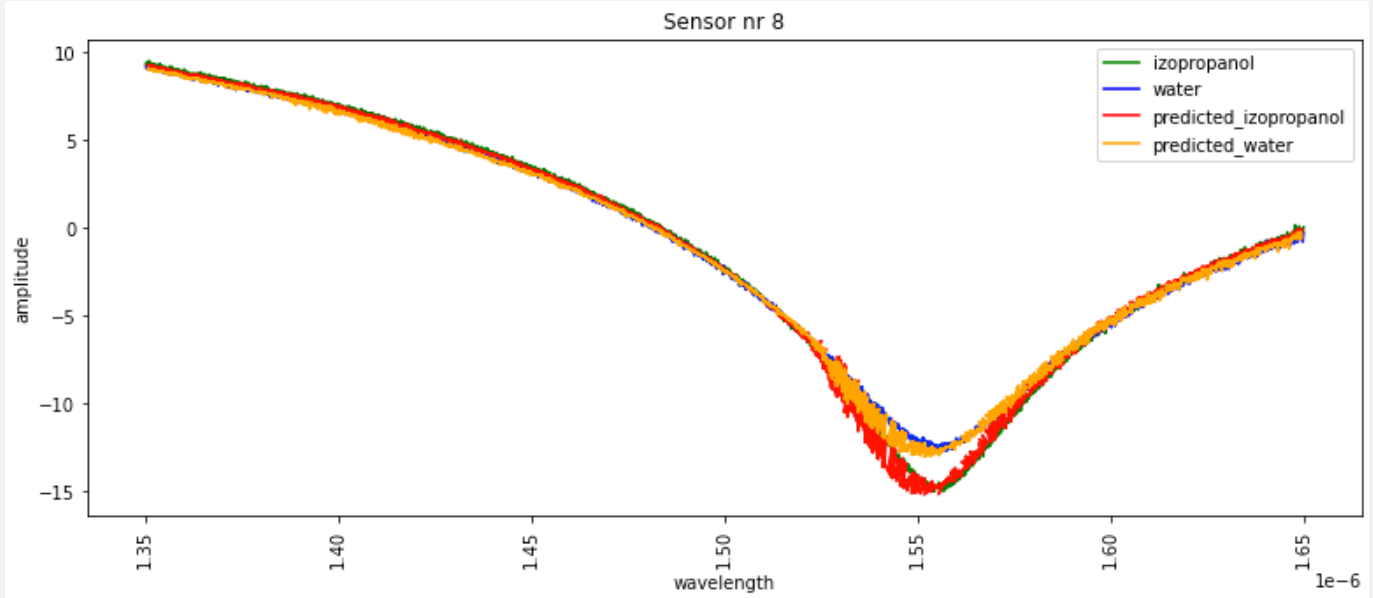


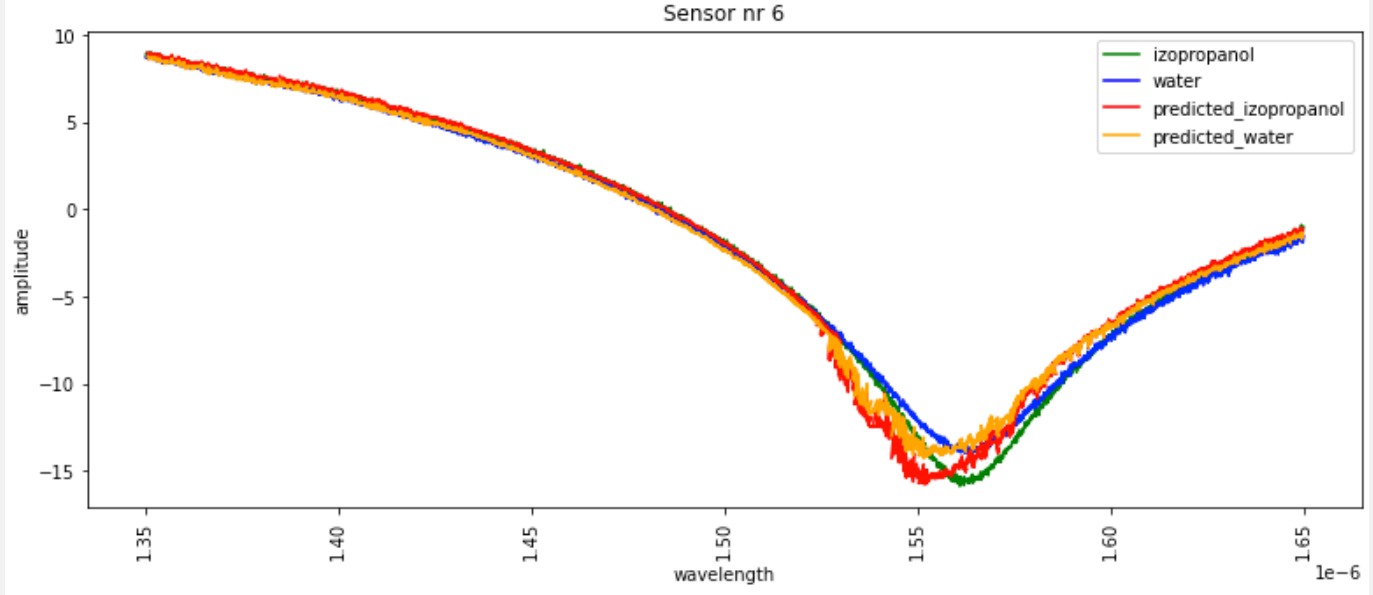
RANDOM FOREST REGRESSOR





K-NEIGHBORS REGRESSOR



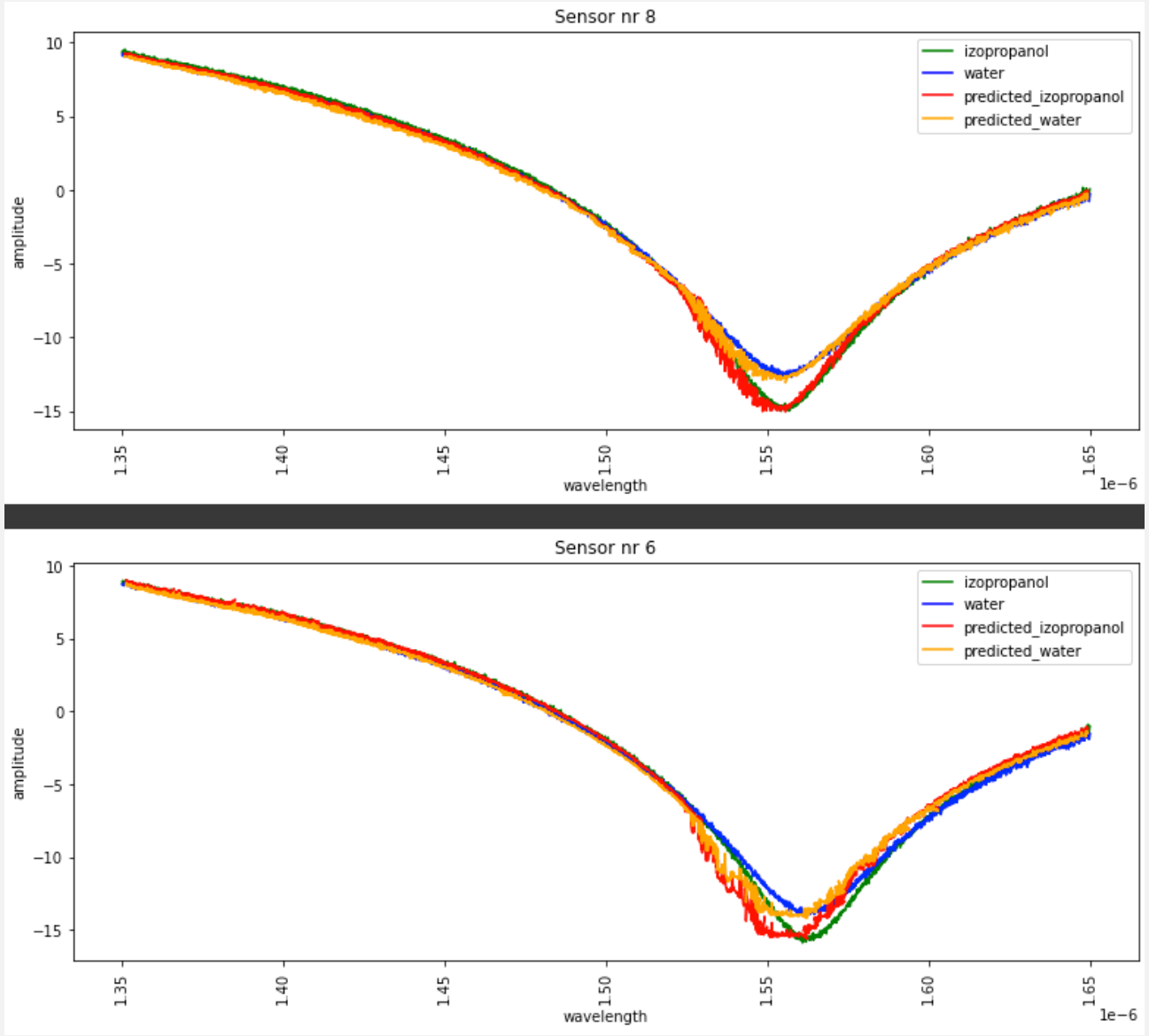


BEST MODEL

To predict characteristics of a working sensor in water and isopropanol based on measured characteristics in air is **Random Forest Regressor**.

R2 Score = 0.9971

MSE = 0.0391



IF YOU NEED MORE INFORMATION:

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