

Model Analysis

2/27/23

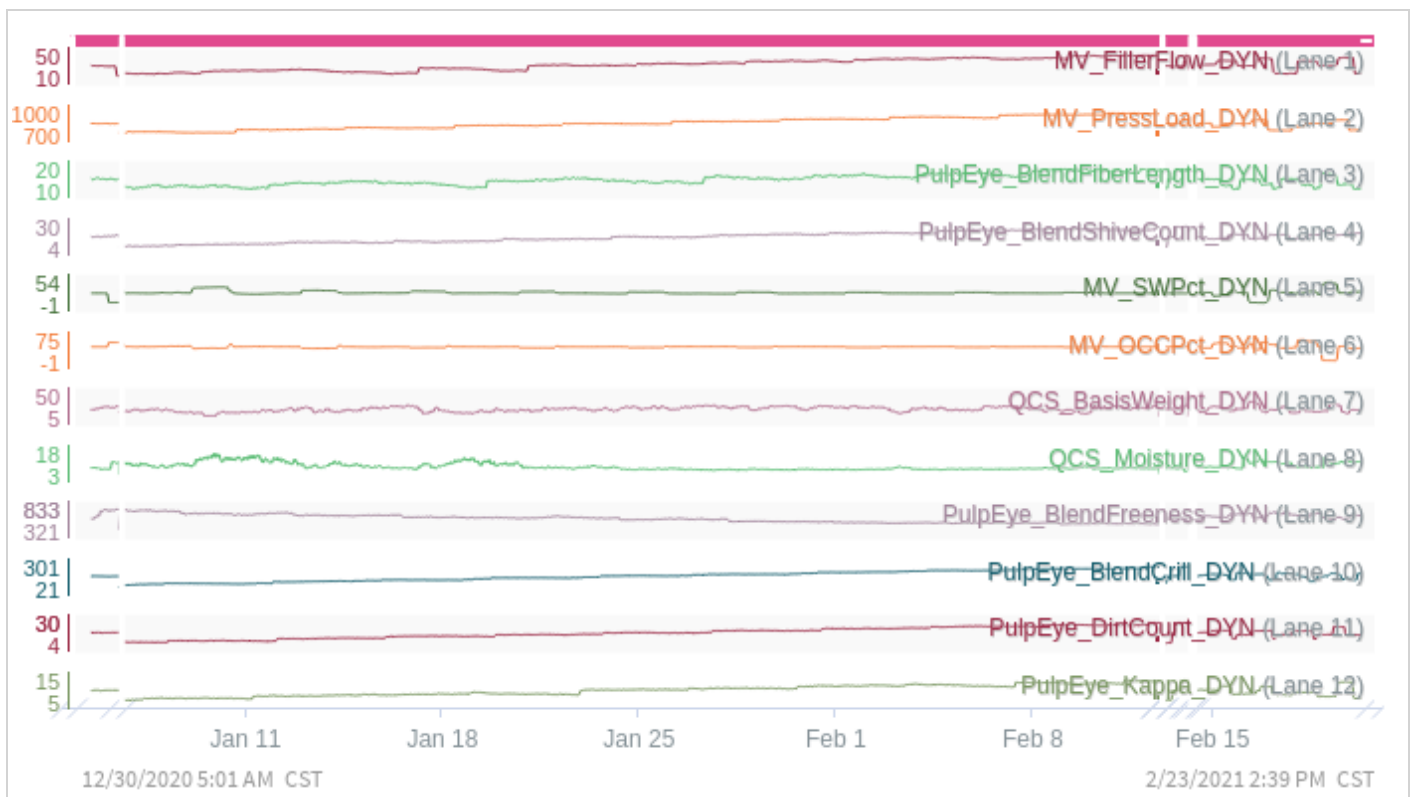
The model for this lab property is analyzed in the following sections:

1. Data pre-processing: The original data used in the configuration of the model
2. Model fit: The ability of the model to accurately predict the lab property
3. Gain analysis: Confirmation that the model gains are consistent with first principle understanding

Data pre-processing

The original data used in the model is shown below with the model inputs (_DYN tags) and the lab values when the process is running (_Running tag).

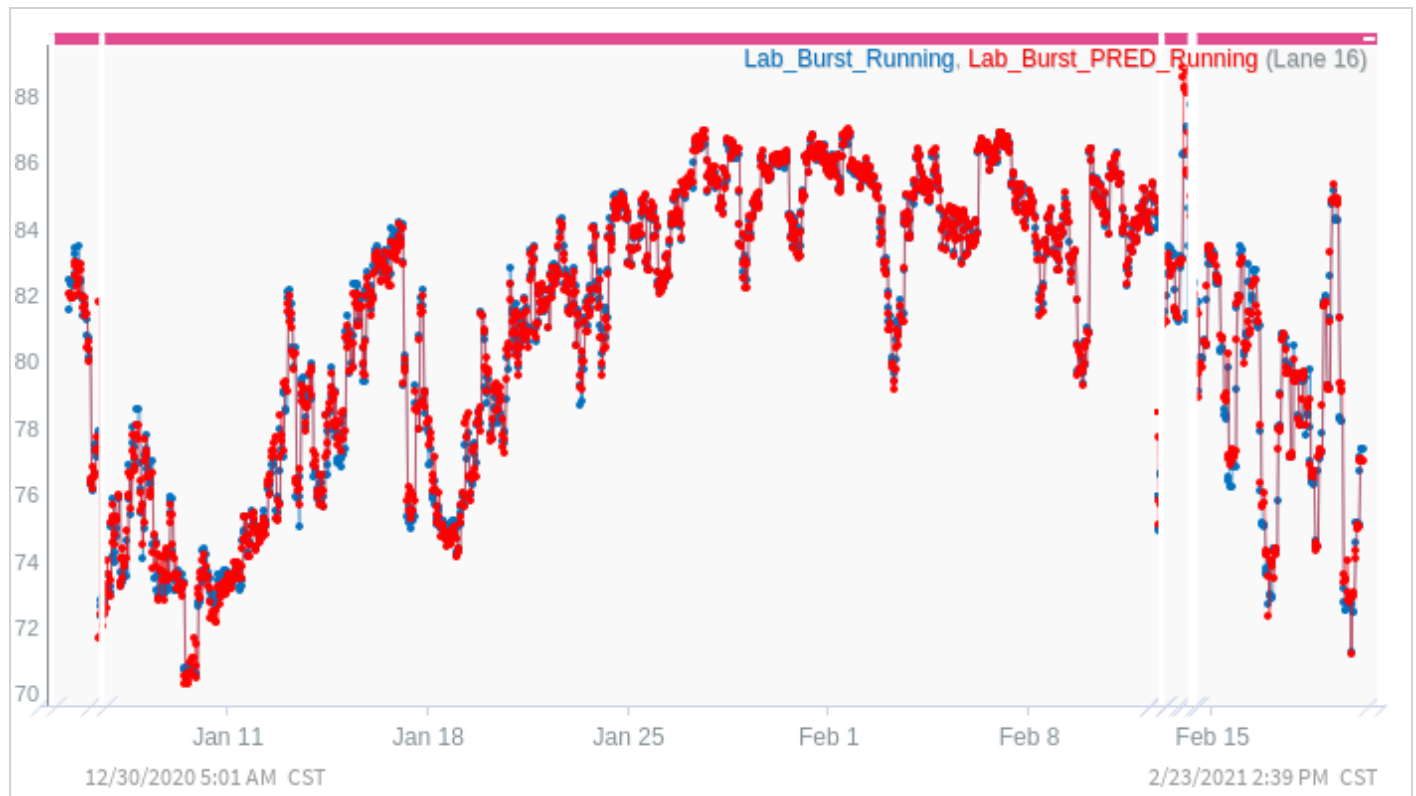
The date range can be changed by going to the Properties tab on the left and editing the "Date Range - Training" range.



Statistics for the data used in the model is shown below:

Name	Avg	Max	Min	S.D.	Count
Data valid	-	-	-	-	7
Lab_Burst	80.901	88.898	69.59	4.2895	3,638
Lab_Burst_PRED	81.008	89.027	70.118	4.2802	781,943
Lab_Burst_PRED_Running	81.071	88.852	70.245	4.2928	3,254
Lab_Burst_Running	81.014	87.675	70.544	4.276	3,254
MV_FillerFlow_DYN	31.816	50.028	10.071	11.049	780,773
MV_OCCPct_DYN	49.565	75.269	-0.784	7.1645	780,773
MV_PressLoad_DYN	853.83	1000.5	699.87	82.131	780,762
MV_SWPct_DYN	25.992	54.342	-0.836	6.0063	780,773
PulpEye_BlendCrill_DYN	177.02	301.31	21.146	67.114	780,761
PulpEye_BlendFiberLength_DYN	14.63	20.359	9.5687	2.7819	780,761
PulpEye_BlendFreeness_DYN	602.52	832.96	320.61	96.926	780,761
PulpEye_BlendShiveCount_DYN	17.334	30.489	4.4922	6.5815	780,761
PulpEye_DirtCount_DYN	17.405	30.234	4.4918	6.6738	780,761
PulpEye_Kappa_DYN	9.9705	15.095	4.7801	2.6822	780,761
QCS_BasisWeight_DYN	20.435	50	5	5.0629	65,087
QCS_Moisture_DYN	8.5876	18.274	3.0792	2.5033	65,087

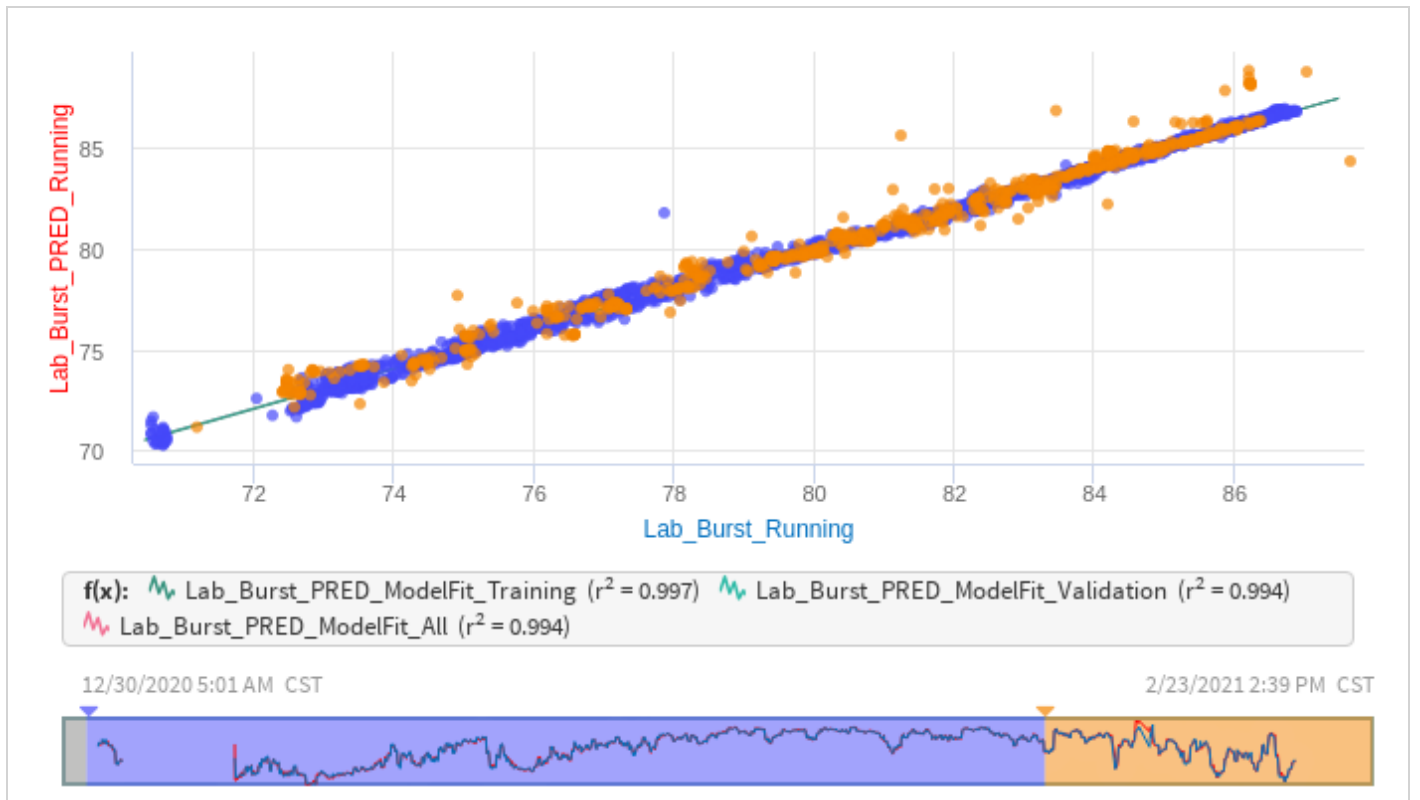
Model fit



The model fit to the data is shown, along with the r^2

Training data is blue

Validation data is orange



Detailed statistics for the model are in the table below:

Legend

Variable	Name
\$a	QCS_BasisWeight_DYN
\$b	MV_PressLoad_DYN
\$c	PulpEye_BlendShiveCount_DYN
\$d	QCS_Moisture_DYN
\$e	MV_FillerFlow_DYN
\$f	PulpEye_BlendFiberLength_DYN
\$g	MV_SWPct_DYN
\$h	PulpEye_BlendFreeness_DYN
\$i	PulpEye_BlendCrill_DYN
\$j	PulpEye_Kappa_DYN
\$k	MV_OCCPct_DYN

Variable	Name
\$l	PulpEye_DirtCount_DYN

Coefficients

Name	Coefficient	Std. Error	P-Value
\$a	0.5105	0.0302	6e-61
\$b	0.1295	0.0554	0.0195
\$c	0.1939	0.0628	0.002
\$d	-2.583	0.1043	2e-122
\$e	-0.225	0.0251	5e-19
\$f	0.3346	0.2368	0.1577
\$g	0.0583	0.0122	1.8e-6
\$h	-0.104	0.0137	3e-14
\$i	0.0413	0.0079	2.1e-7
\$j	-0.761	0.2518	0.0025
\$k	-0.047	0.0173	0.0071
\$l	-0.444	0.0553	1e-15
\$a^2	-0.003	0.0017	0.0399
\$b^2	-1e-4	6.5e-5	0.0818
\$c^2	-0.025	0.0037	2e-11
\$d^2	0.1071	0.0096	2e-28
\$e^2	0.0067	0.0009	4e-14
\$f^2	0.0126	0.016	0.4316
\$g^2	-6e-6	0.0007	0.9933
\$h^2	0.0002	2.2e-5	7e-17
\$i^2	-1e-4	4.9e-5	0.0176
\$j^2	0.0918	0.0249	0.0002
\$k^2	0.0015	0.0005	0.0014
\$l^2	0.0322	0.0035	1e-19
\$a^3	-6e-5	3.0e-5	0.0472
\$b^3	3.4e-8	2.6e-8	0.186
\$c^3	0.0005	6.8e-5	2e-15
\$d^3	-5e-4	0.0003	0.0667
\$e^3	-7e-5	9.2e-6	3e-15
\$f^3	-7e-4	0.0004	0.039

Name	Coefficient	Std. Error	P-Value
\$g^3	-5e-6	1.1e-5	0.6756
\$h^3	-1e-7	1.1e-8	2e-21
\$i^3	2.8e-7	9.7e-8	0.0042
\$j^3	-0.004	0.0008	3.9e-7
\$k^3	-2e-5	3.9e-6	6.5e-5
\$l^3	-7e-4	7.2e-5	9e-23

Statistics

Name	Value
intercept	55.907
interceptStandardError	15.484
adjustedRSquared	0.9969
regressionSumSquares	52390
errorSumSquares	161.6
suggestedPValueCutoff	0.001
rSquared	0.9969

Gain analysis

We look at the gains in the model, and comment on the result.

This plot is automatically generated by the PM_SIM_Predictions.ipynb DataLab script

X AXIS: Input range from 0% to 100%

Y AXIS: Predicted value of Lab measurement in its engineering units

Analysis comments:

- Used mismatch data

