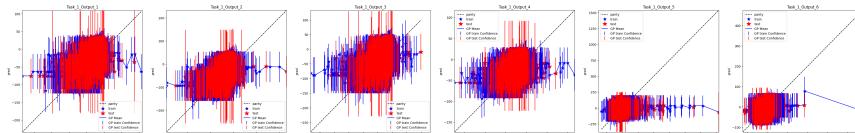


# Reduce dimensions

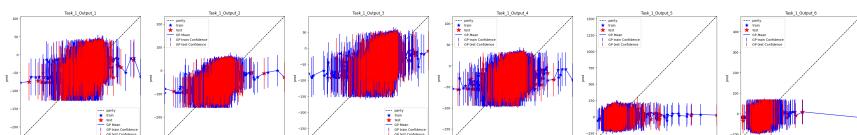
Wednesday, July 30, 2025 1:05 AM

50 features



	Task_1_Output_1	Task_1_Output_2	Task_1_Output_3	Task_1_Output_4	\
MAE	1.896000e+01	2.314000e+01	2.159000e+01	1.503000e+01	
MAE2	1.395000e+01	1.518000e+01	1.557000e+01	1.070000e+01	
MSE	6.880500e+02	1.089240e+03	8.537900e+02	4.327000e+02	
RMSE	2.623000e+01	3.300000e+01	2.922000e+01	2.080000e+01	
MAPE	1.039211e+15	1.180411e+15	1.282482e+15	8.694970e+14	
MAXE	1.340300e+02	2.648900e+02	1.634000e+02	1.053500e+02	
EVS	3.700000e-01	3.900000e-01	3.900000e-01	2.600000e-01	
R2	3.700000e-01	3.900000e-01	3.900000e-01	2.600000e-01	
AVG_STD	-1.610000e+00	-1.940000e+00	-1.730000e+00	-1.640000e+00	
MIN_STD	-1.560000e+00	-1.870000e+00	-1.670000e+00	-1.590000e+00	
MAX_STD	-4.590000e+00	-5.780000e+00	-4.940000e+00	-4.580000e+00	

	Task_1_Output_5	Task_1_Output_6
MAE	5.288000e+01	1.515000e+01
MAE2	2.302000e+01	1.062000e+01
MSE	1.274714e+04	4.987200e+02
RMSE	1.129000e+02	2.233000e+01
MAPE	6.169283e+14	1.020740e+15
MAXE	1.602110e+03	1.747000e+02
EVS	3.000000e-02	1.500000e-01
R2	3.000000e-02	1.400000e-01
AVG_STD	-2.328000e+01	-3.830000e+00
MIN_STD	-2.289000e+01	-3.780000e+00
MAX_STD	-4.488000e+01	-6.550000e+00

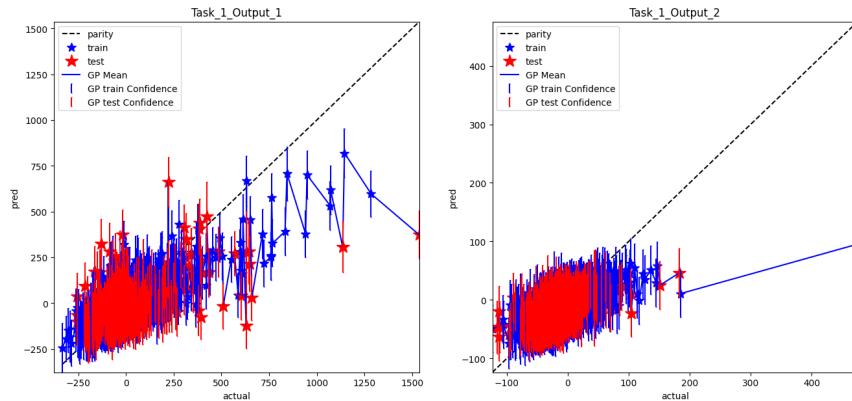


	Task_1_Output_1	Task_1_Output_2	Task_1_Output_3	Task_1_Output_4	\
MAE	1.899000e+01	2.321000e+01	2.160000e+01	1.505000e+01	
MAE2	1.383000e+01	1.558000e+01	1.540000e+01	1.106000e+01	
MSE	6.814300e+02	1.086050e+03	8.598100e+02	4.365200e+02	
RMSE	2.610000e+01	3.296000e+01	2.932000e+01	2.089000e+01	
MAPE	1.033771e+15	1.313832e+15	1.270993e+15	8.572940e+14	
MAXE	1.343100e+02	2.622000e+02	1.664500e+02	1.045100e+02	
EVS	3.800000e-01	3.900000e-01	3.900000e-01	2.600000e-01	
R2	3.700000e-01	3.900000e-01	3.900000e-01	2.600000e-01	
AVG_STD	-1.610000e+00	-1.860000e+00	-1.670000e+00	-1.690000e+00	

<b>MIN_STD</b>	-1.600000e+00	-1.850000e+00	-1.650000e+00	-1.680000e+00
<b>MAX_STD</b>	-1.800000e+00	-2.110000e+00	-1.920000e+00	-1.950000e+00
<b>Task_1_Output_5</b>		<b>Task_1_Output_6</b>		
<b>MAE</b>	5.305000e+01	1.519000e+01		
<b>MAE2</b>	2.269000e+01	1.091000e+01		
<b>MSE</b>	1.247675e+04	5.065400e+02		
<b>RMSE</b>	1.117000e+02	2.251000e+01		
<b>MAPE</b>	6.778064e+14	1.119183e+15		
<b>MAXE</b>	1.510910e+03	1.749600e+02		
<b>EVS</b>	5.000000e-02	1.300000e-01		
<b>R2</b>	5.000000e-02	1.300000e-01		
<b>AVG_STD</b>	-2.305000e+01	-3.820000e+00		
<b>MIN_STD</b>	-2.291000e+01	-3.810000e+00		
<b>MAX_STD</b>	-2.622000e+01	-4.070000e+00		

Before dimension reduction (159 features, last two targets)

	<b>Task_1_Output_1</b>	<b>Task_1_Output_2</b>
<b>MAE</b>	47.31	11.65
<b>MAE2</b>	19.4	6.66
<b>MSE</b>	9492.33	359.66
<b>RMSE</b>	97.43	18.96
<b>MAPE</b>	410408282431536.94	356189060245255.7
<b>MAXE</b>	1164.57	136.73
<b>EVS</b>	<b>0.28</b>	<b>0.38</b>
<b>R2</b>	0.27	0.38
<b>AVG_STD</b>	-18.25	-2.62
<b>MIN_STD</b>	-16.92	-2.52
<b>MAX_STD</b>	-32.02	-3.57



Log1p transformation after minmax for last two y

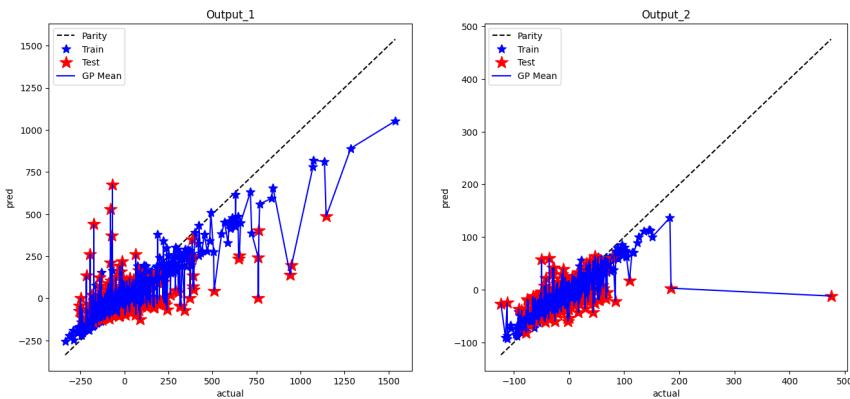
	<b>Task_1_Output_1</b>	<b>Task_1_Output_2</b>
<b>MAE</b>	0.0199999952965200	0.0199999952965200
<b>MAE2</b>	0.00999999776482580	0.00999999776482580
<b>MSE</b>	0.0	0.0
<b>RMSE</b>	0.0399999910593030	0.02999999329447700
<b>MAPE</b>	0.12999999523162800	0.12999999523162800
<b>MAXE</b>	0.4600000834465000	0.1700000178813900
<b>EVS</b>	<b>0.28</b>	<b>0.39</b>
<b>R2</b>	0.28	0.39
<b>AVG_STD</b>	0.409999964237210	0.310000023841860
<b>MIN_STD</b>	0.38000009560199500	0.30000001182002000

<b>MIN_STD</b>	0.369999990009400000	0.300000001192092900
<b>MAX_STD</b>	0.5600000023841860	0.4399999976158140

### Random forest

Test	Output_1	Output_2
<b>MAE</b>	42.59	11.98
<b>MAE2</b>	12.8	5.85
<b>MSE</b>	9234.55	620.54
<b>RMSE</b>	96.1	24.91
<b>MAPE</b>	63.99	45.27
<b>MAXE</b>	803.91	487.31
<b>EVS</b>	0.18	0.2
<b>R2</b>	<b>0.18</b>	<b>0.2</b>
<b>AVG_STD</b>	0.0	0.0
<b>MIN_STD</b>	0.0	0.0
<b>MAX_STD</b>	0.0	0.0

Train	Output_1	Output_2
<b>MAE</b>	14.49	4.09
<b>MAE2</b>	4.39	2.03
<b>MSE</b>	1009.77	47.27
<b>RMSE</b>	31.78	6.88
<b>MAPE</b>	24.07	16.43
<b>MAXE</b>	485.07	50.72
<b>EVS</b>	0.89	0.92
<b>R2</b>	<b>0.89</b>	<b>0.92</b>
<b>AVG_STD</b>	0.0	0.0
<b>MIN_STD</b>	0.0	0.0
<b>MAX_STD</b>	0.0	0.0

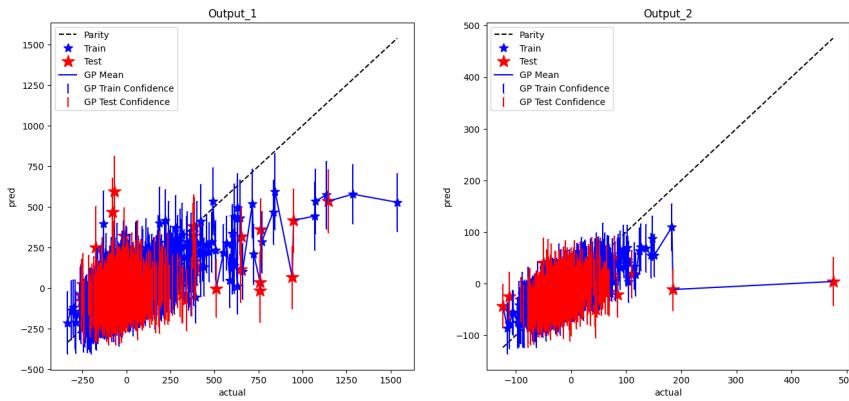


### Single GP

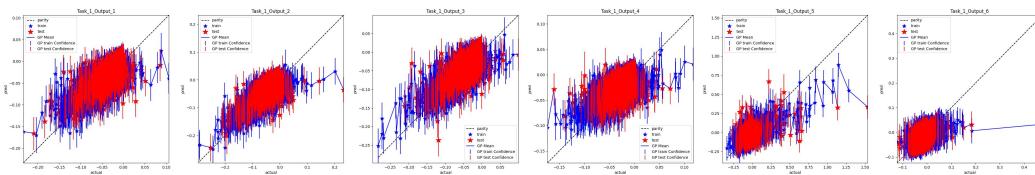
Test	Output_1	Output_2
----	10.10	10.00

<b>MAE</b>	42.48	12.09
<b>MAE2</b>	15.97	6.1
<b>MSE</b>	8433.83	607.08
<b>RMSE</b>	91.84	24.64
<b>MAPE</b>	105.18	91.4
<b>MAXE</b>	875.11	471.26
<b>EVS</b>	0.25	0.22
<b>R2</b>	0.25	0.22
<b>AVG_STD</b>	176.92	41.66
<b>MIN_STD</b>	154.52	35.44
<b>MAX_STD</b>	255.75	54.93

Train	Output_1	Output_2
<b>MAE</b>	31.24	8.01
<b>MAE2</b>	12.45	4.16
<b>MSE</b>	3997.85	170.14
<b>RMSE</b>	63.23	13.04
<b>MAPE</b>	66.14	34.91
<b>MAXE</b>	1009.77	99.93
<b>EVS</b>	0.57	0.7
<b>R2</b>	0.57	0.7
<b>AVG_STD</b>	174.69	41.04
<b>MIN_STD</b>	153.88	34.74
<b>MAX_STD</b>	255.4	54.8



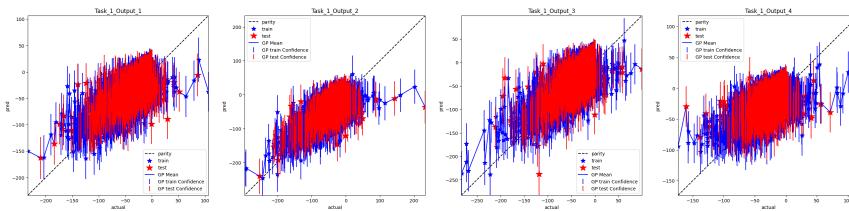
Before dimension reduction (159 features)



	Task_1_Output_1	Task_1_Output_2	Task_1_Output_3	Task_1_Output_4	Task_1_Output_5	Task_1_Output_6

<b>MAE</b>	0.01	0.02	0.01	0.01	0.05	0.01
<b>MAE2</b>	0.01	0.01	0.01	0.01	0.02	0.01
<b>MSE</b>	0.0	0.0	0.0	0.0	0.01	0.0
<b>RMSE</b>	0.02	0.03	0.02	0.02	0.1	0.02
<b>MAPE</b>	203042853013.75	215581028069.66	216080128540.48	179572875770.09	523075112400.46	192302908488.69
<b>MAXE</b>	0.12	0.27	0.16	0.13	1.2	0.15
<b>EVS</b>	0.6	0.62	0.65	0.39	0.28	0.4
<b>R2</b>	0.6	0.62	0.65	0.39	0.28	0.39
<b>AVG_STD</b>	-1.13	-1.32	-1.09	-1.28	-20.8	-3.24
<b>MIN_STD</b>	-1.09	-1.27	-1.04	-1.22	-19.66	-3.18
<b>MAX_STD</b>	-1.68	-2.02	-1.77	-2.0	-36.58	-3.91

Before dimension reduction (159 features), first four features



	<b>Task_1_Output_1</b>	<b>Task_1_Output_2</b>	<b>Task_1_Output_3</b>	<b>Task_1_Output_4</b>
<b>MAE</b>	13.16	15.59	13.77	11.71
<b>MAE2</b>	6.93	8.16	8.0	6.44
<b>MSE</b>	432.66	677.96	485.66	348.36
<b>RMSE</b>	20.8	26.04	22.04	18.66
<b>MAPE</b>	248800014750455.3	286256435723804.2	273707128521784.47	174669467546814.28
<b>MAXE</b>	118.52	270.1	157.91	130.94
<b>EVS</b>	0.6	0.62	0.65	0.41
<b>R2</b>	0.6	0.62	0.65	0.41
<b>AVG_STD</b>	-1.2	-1.41	-1.15	-1.36
<b>MIN_STD</b>	-1.16	-1.37	-1.1	-1.32
<b>MAX_STD</b>	-1.57	-1.82	-1.62	-1.71