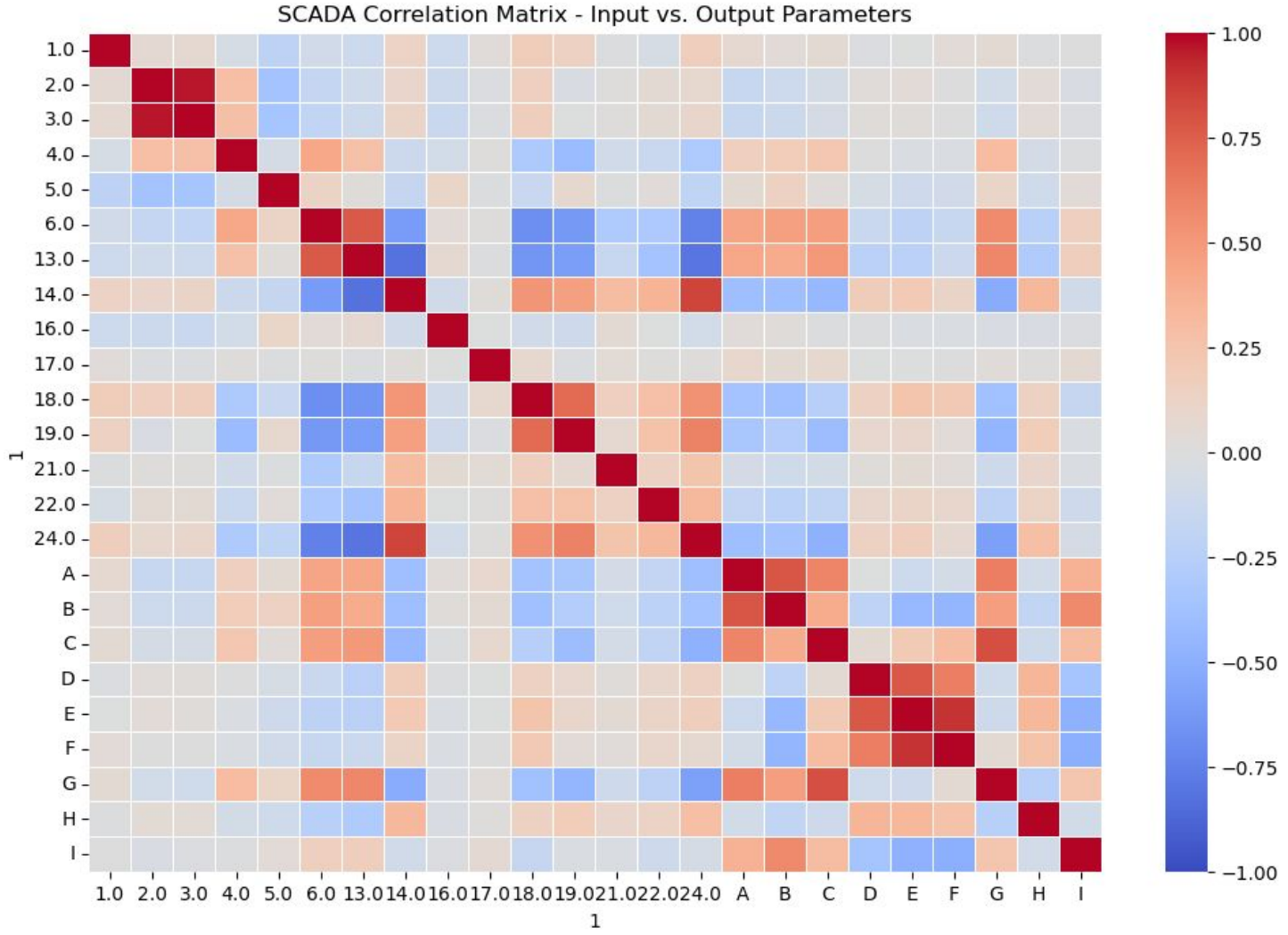
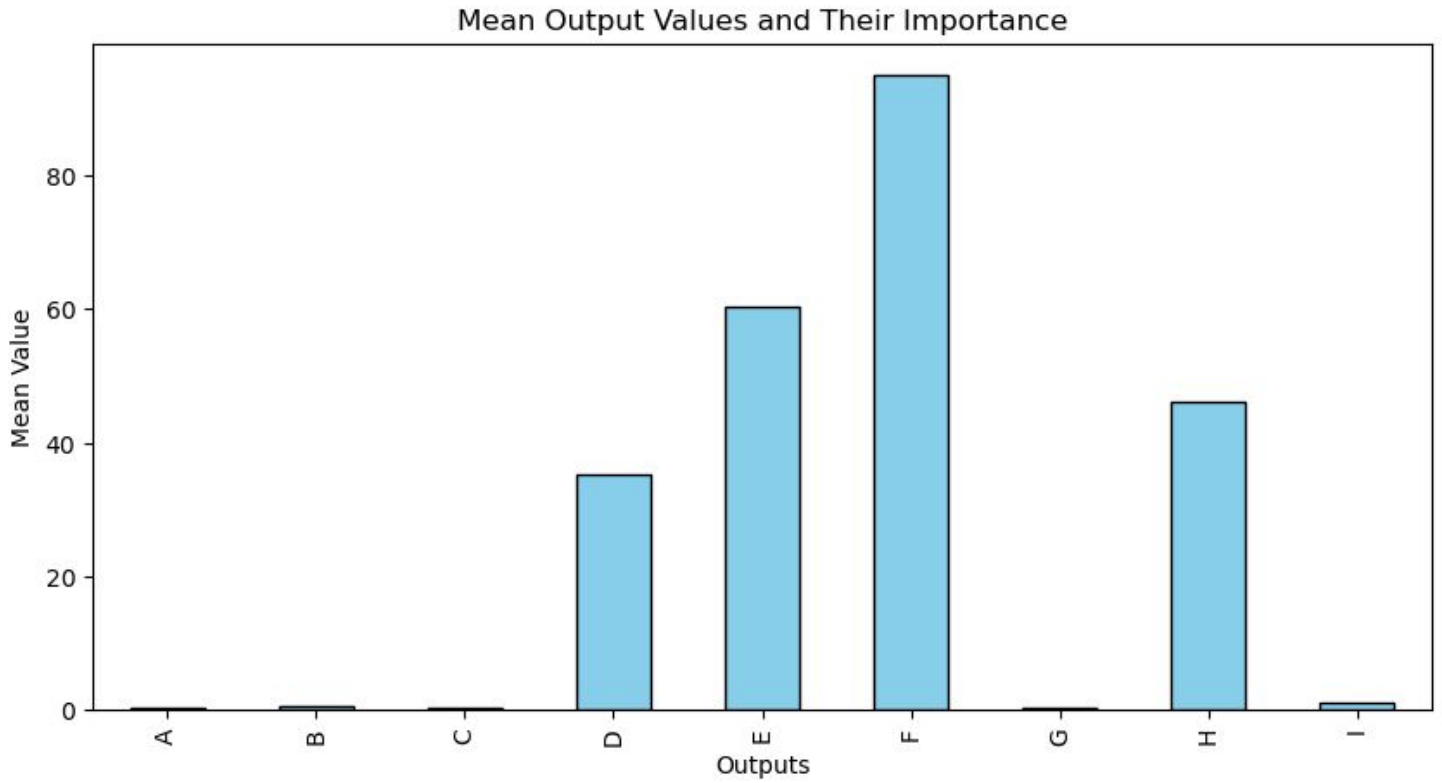
Input-Output Correlation Matrix for Process Optimization

This heatmap visualizes the correlation between system input parameters (labeled 1 to 24) and output parameters (labeled A to I). Strong positive (red) and negative (blue) correlations reveal which inputs have the most impact on key outputs. These insights support better process control, quality improvements, and performance optimization across operations.

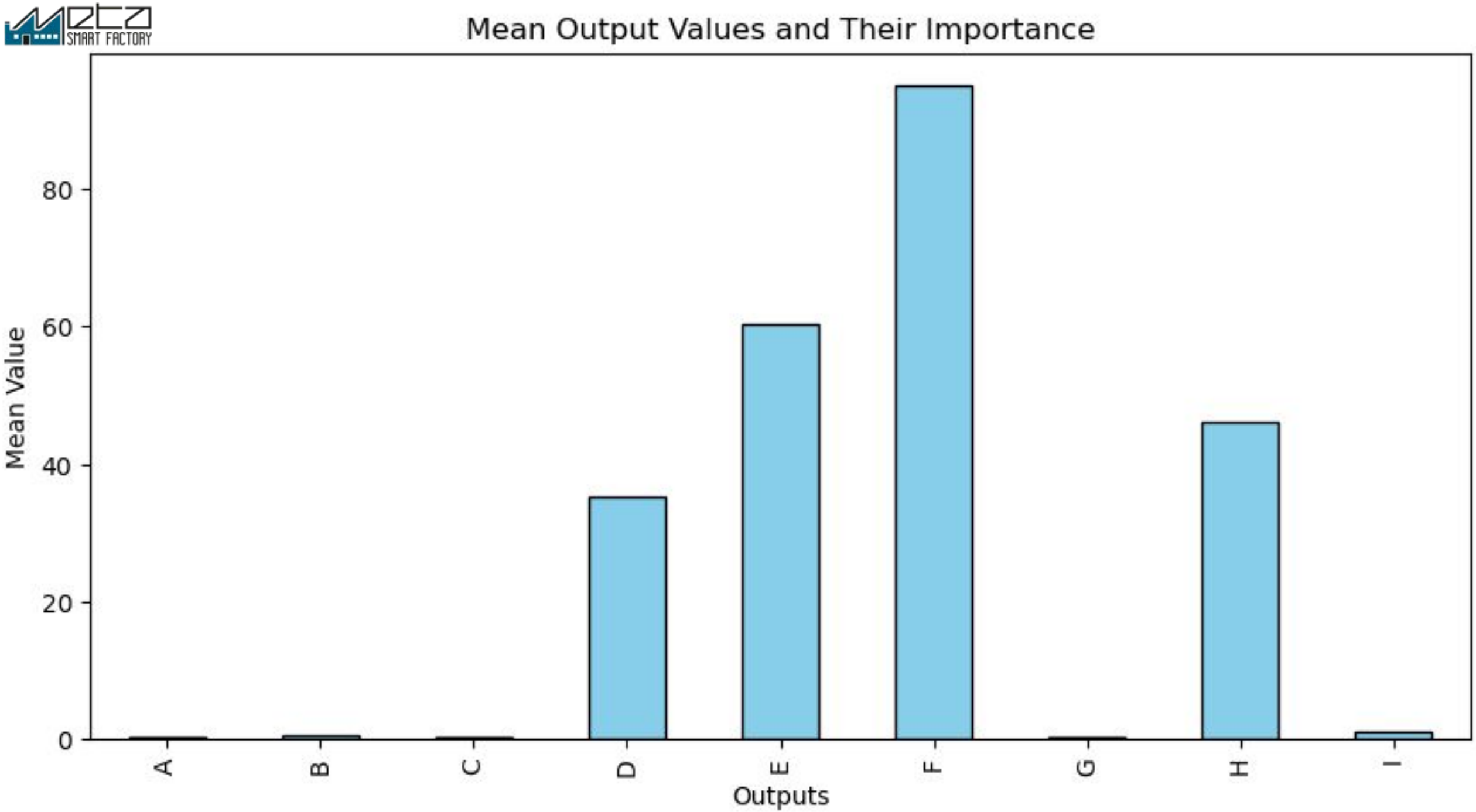


Output Performance Analysis for Process Optimization

This chart presents the average values of critical output parameters across the process. By comparing these to optimal targets, we can identify deviations that may affect quality, efficiency, or productivity. The goal is to guide decision-making for performance improvement and optimization.




```
Optimal output values:
A     0.25945
B     0.55805
C     0.27570
D    35.60000
E    61.10000
F    96.50000
G     0.30800
H    46.40000
I     0.89000
dtype: float64
```


Mean Output Values and Their Importance
Mean Value
0
20
40
60
80
A
B
C
D
E
F
G
H
I
Outputs

Model Prediction Based on Input Parameters

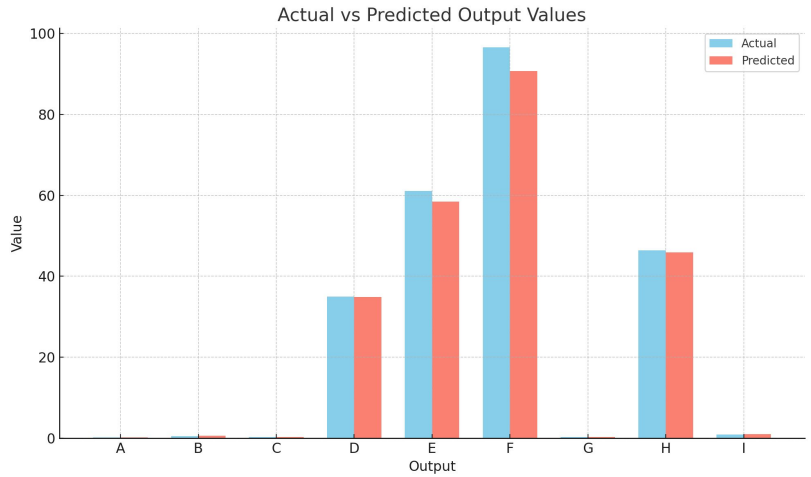
This slide shows the actual input values fed into the predictive model and the corresponding predicted output values (A to I). These results demonstrate how the model can simulate process outcomes and support digital twin applications or what-if analysis in manufacturing environments.

Input values

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	24
32	33	37	71	260	12.5	0.35	0.24	0.14	0.32	0.45	9.75	1.35	0.6	0.5	320	25	20	60	0	15	60

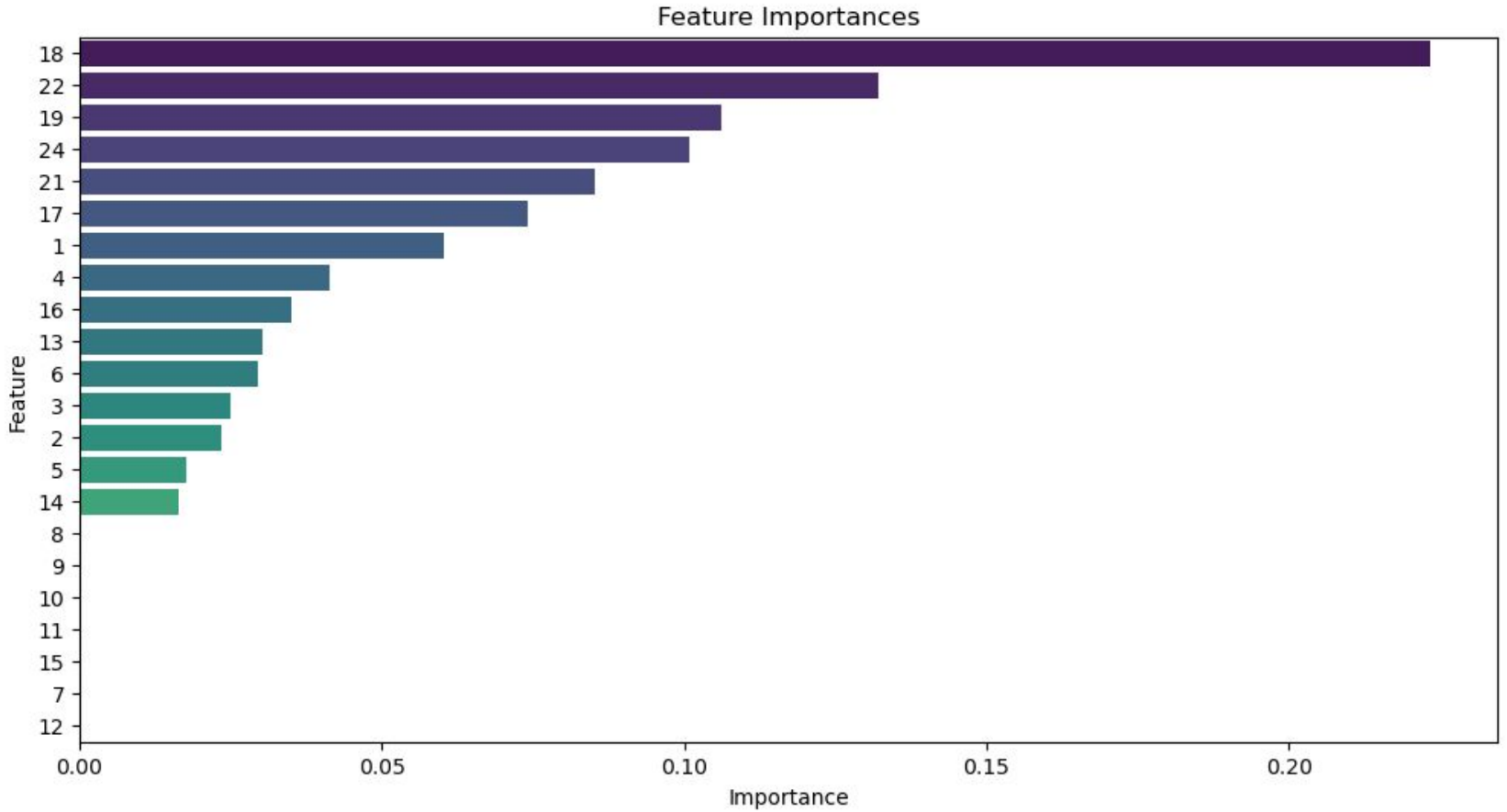
Predicted values

A	B	C	D	E	F	G	H	I
0.260899	0.595555	0.270687	34.92698	58.39675	90.6675	0.307015	45.87969	0.996095



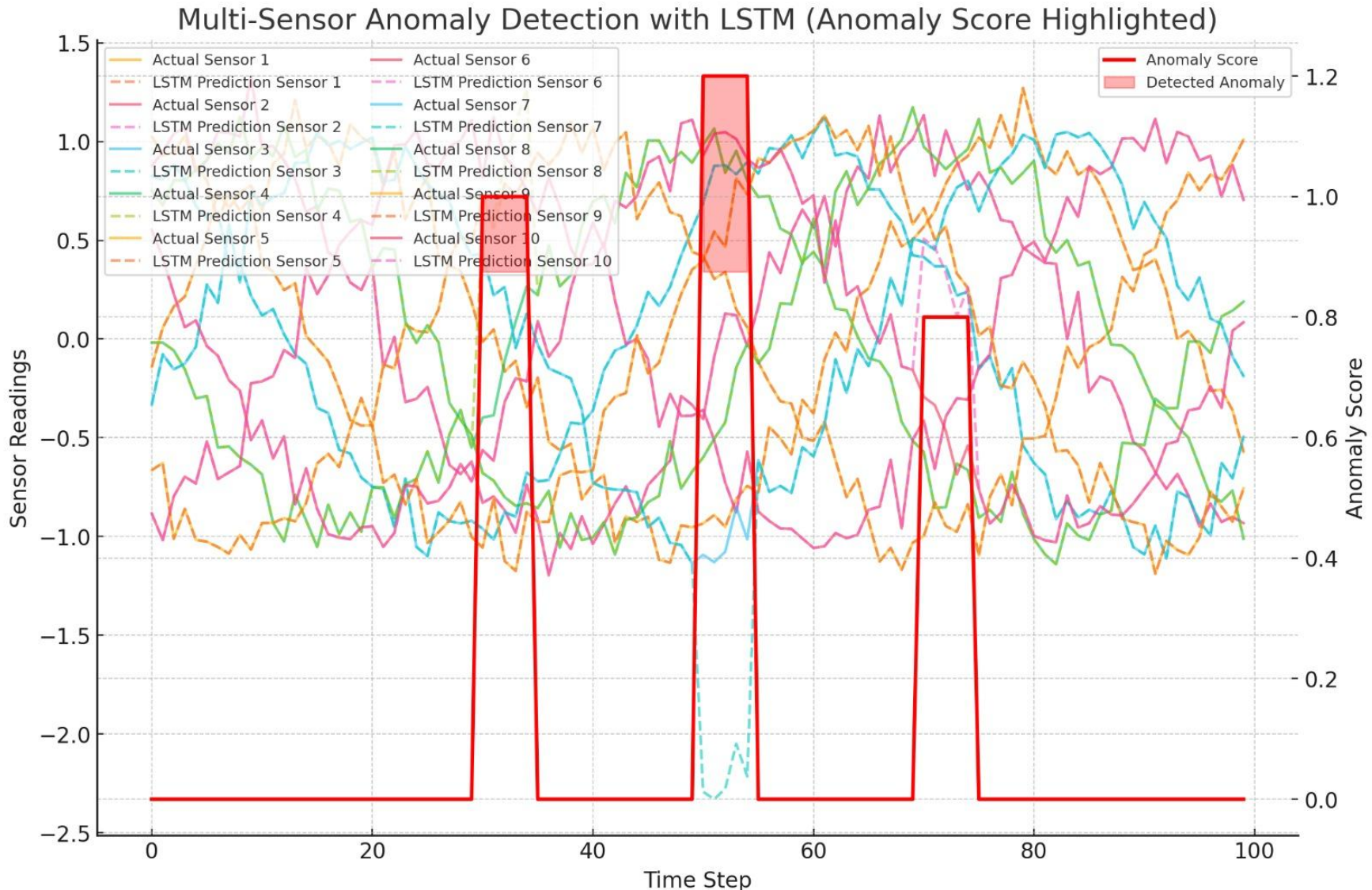
Feature Importance Analysis for Predictive Modeling in Industrial Processes

This chart illustrates the relative importance of each input parameter in predicting the target output variable. Inputs are ranked based on their contribution to the model's predictive accuracy. Higher values indicate stronger influence, helping to prioritize which parameters should be monitored or optimized in industrial process improvement.



Anomaly Detection in Multi-Sensor Data Using LSTM Predictions

This chart illustrates how an LSTM-based model is used to detect anomalies in time-series data collected from multiple sensors. The model learns normal patterns from historical sensor behavior and flags deviations as anomalies. Red highlights indicate high anomaly scores, pointing to unusual or potentially faulty behavior.



SCADA OPTIMIZATION