

## LSTM Model Significantly Outperforms Traditional Model in Predictive Maintenance

Dataset: AI4I 2020 Predictive Maintenance Dataset  
Task: Binary Failure Prediction

KPI\_Total\_Failures

339

KPI\_Failure\_Rate

3.39%

KPI\_Traditional\_Predicted\_Failures

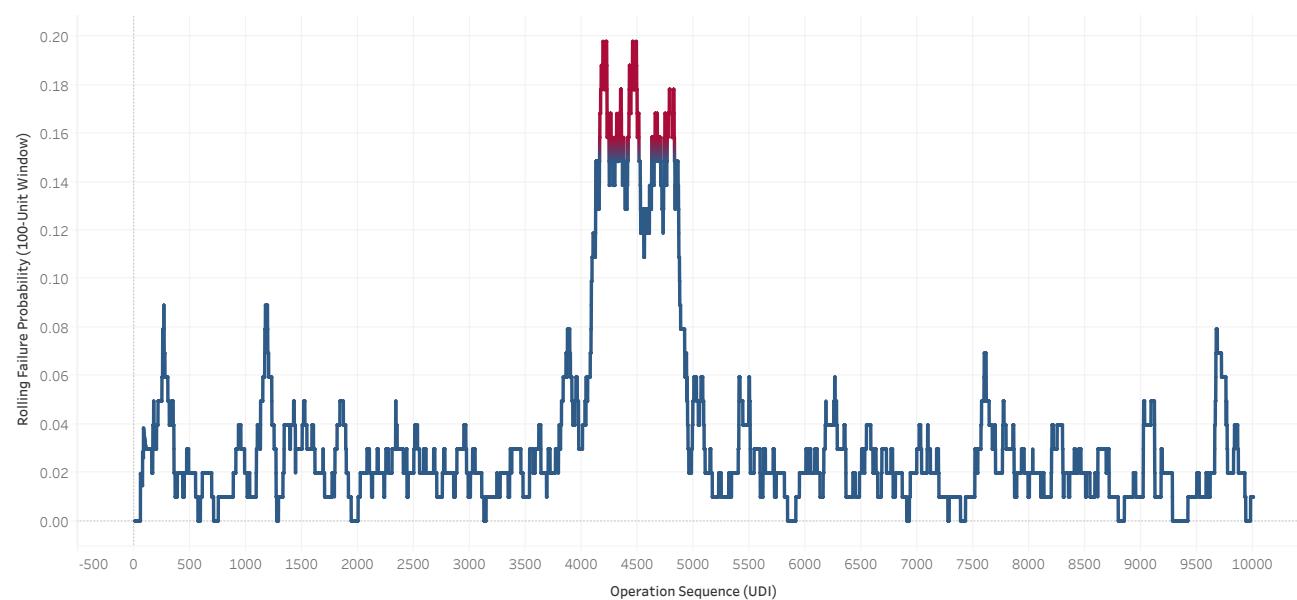
KPI\_LSTM\_Predicted\_Failures

97

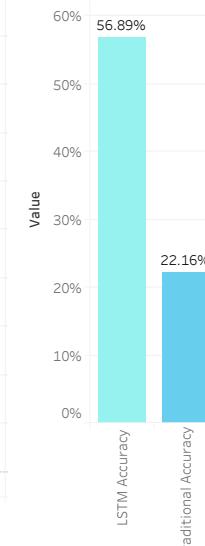
KPI\_Avg\_Predicted\_Risk

50.83%

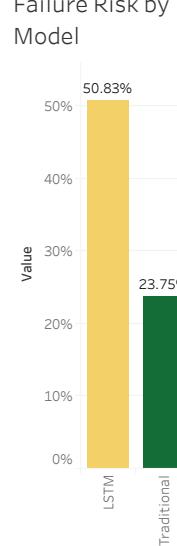
Failure Trend



Model Accuracy Comparison



Average Predicted Failure Risk by Model



Measure Names  
LSTM Accuracy (Cyan)  
Traditional Accuracy (Blue)  
  
Measure Names  
LSTM (Yellow)  
Traditional (Green)

- LSTM accuracy (56.89%) is significantly higher than Traditional (22.16%).
- LSTM predicts more failures (97) than Traditional (31), indicating higher sensitivity.
- Failure probability spikes between UDI 4000–5000.
- LSTM model provides more reliable early warning detection.