## 2 Acronyms

This section describes abbreviations frequently used in the text according to the standard of the *International Federation of Automatic Control, Safe Process*, and Mechanical Engineering communities.

AE	Autoencoder
AI	Artificial Intelligence
AISI	American Iron and Steel Institute
ANN	Artificial Neural Networks
ANOVA	Analysis of Variance
ARR	Analytic redundant relation
BLSTM	Bidirectional Long Short-Term Memory Neural Network
BN	Bayesian Networks
CCD	Central Composite Design
C-MAPSS	Commercial modular aero-propulsion system simulation
CNC	Computer Numerical Control
CPOS	Cutting Parameters Optimization and System
CTWC	Cutting Tool Wear-Condition
CUSUM	Accumulative summation
DNN	Deep neural network
DoE	Design of Experiments
EKF	Extended Kalman filter
EOL	End of life
FDI	Fault Detection and Isolation
GA	Genetic Algorithm
GONNS	Genetically Optimized Neural and Network System
HMM	Hidden Markov Model
HSM	High-Speed Machining
IIoT	Industrial Internet of Things
KF	Kalman Filter
LP	Linear Programming
LSE	Least Squares Estimation

MDP Markov Decision Process MFCC Mel Frequency Cepstrum Coefficients MIMO Multiple Inputs Multiple Outputs ML Machine Learning Mean Square Error MSE NMPM Neural Milling Process Model NSM Neural Simulator Model PCA Principal Component Analysis RG **Residual Generator** RSM Response Surface Methodology RUL Remaining useful life SCADA Supervisory Control and Data Acquisition SISO Single-input Single-output **SVDD** Support vector data description