

## List of Abbreviations

### A

ABC	approximated bootstrap confidence
ACK	acknowledgment
ADDT	accelerated destructive degradation tests
ADI	average inter-demand interval
ADT	accelerated degradation test
AF	acceleration factor
AGP	arithmetico-geometric process
ALM	accelerated life model
ALT	accelerated life testing
AMA	arithmetic moving-average
ANN	artificial neural networks
ANOVA	analysis of variations
AP	arithmetic process
APC	automatic process control
AQL	acceptable quality level
AQM	active queue management
AR	autoregressive process
ARI	adjusted Rand index
ARL	average run length
ARMA	autoregressive and moving average
ARMDT	accelerated repeated measures degradation tests
ARRSES	adaptive response rate single-exponential smoothing
ART	accelerated reliability
ASN	average sample number
ASQ	American Society for Quality
ATI	average total inspection
AUC	area under the receiver operating characteristics curve
AW	additive Winter

### B

BIB	burn-in board
BIR	built-in reliability
BLAST	Berkeley lazy abstraction software verification tool
BLUP	best linear unbiased predictor
BM	binomial model
BVE	bivariate exponential

### C

CART	classification and regression tree
CBFQ	credit-based fair queueing
CBQ	class-based queues
CCD	central composite design
CDF	cumulative distribution function

CE	classification error
CF	characteristic function
CFE	Cauchy functional equation
CFF	call for fire
CHAID	chi-square automatic interaction detection
CID	collision-induced dissociation
CIM	cluster-image map
CLT	central limit theorem
CM	corrective maintenance
CML	canonical maximum likelihood
CMW	combination warranty
CNM	customer needs mapping
COPQ	cost of poor quality
COT	cumulative sum of $T$
cPLP	capacitated plant location problem
CRC	cumulative results criterion
CRUISE	classification rule with unbiased interaction selection and estimation
CS-CQ	cycle stealing with central queue
CS-ID	cycle stealing with immediate dispatch
CSALT	constant-stress accelerated life test
CSS	conditional single-sampling
CTQ	critical-to-quality
CUSUM	cumulative sum
CV	coefficient of variance
CV	cross-validation
CVP	critical value pruning
CX	cycle crossover
Cdf	cumulative distribution function
Cuscore	cumulative score
Cusum	cumulative sum

### D

DBI	dynamic burn-in
DBSCAN	Density-based clustering
DCCDI	define, customer concept, design, and implement
DES	double-exponential smoothing
df	degrees of freedom
DFM	design for manufacturability
DFR	decreasing failure rate
DFR	design for reliability
DFSS	design for Six Sigma
DFY	design for yield
DLBI	die-level burn-in
DLBT	die-level burn-in and testing
DM	Data mining
DMADV	define, measure, analyze, design and verify
DMAIC	define, measure, analyze, improve, and control

DMAICT	define, measure, analyze, improve, control and technology transfer
DOE	design of experiments
DP	dynamic programming
DP	design parameters
DPMO	defects per million opportunities
DQ	dual-queue
DQLT	dual queue length threshold
DRD	dynamic robust design
DRR	deficit round-robin
DSSP	dependent stage sampling plan
DUT	device under test
DWC	discounted warranty cost
DoD	Department of Defense

**E**

EBD	equivalent business days
EBP	error-based pruning
EDWC	expected discounted warranty cost
EF	estimating function
EM	expectation maximization
EOQ	economic order quantity
EOS	electrical-over-stress
EQL	expected quality loss
ES	exponential smoothing
ESC	expected scrap cost
ESD	electrostatic discharge
ETC	expected total cost
EWC	expected warranty cost
EWMA	exponentially weighted moving average
EWMAST	exponentially weighted moving average chart for stationary processes

**F**

FCFS	first-come first-served
FDR	false discovery rate
FIR	fast initial response
FMEA	failure modes and effects analysis
FR	failure rate
FR	functional requirements
FRPW	free repair warranty
FRW	free replacement warranty
FSI	fixed sampling interval
FSW	full-service warranty
FTP	file transfer protocol
FWER	family-wise error rate

**G**

GA	genetic algorithms
GAB	generator armature bars
GAM	generalized additive model
GAOT	genetic algorithm optimization toolbox
GEE	generalized estimating equation

GERT	graphical evaluation and review technique
GLM	general linear model
GLM	generalized linear model
GLMM	generalized linear mixed model
GLRT	generalized likelihood ratio test
GP	geometric process
GUIDE	generalized, unbiased interaction detection and estimation

**H**

HALT	highly accelerated life tests
HCF	highest class first
HDL	high-density lipoprotein
HEM	heterogeneous error model
HEM	hybrid evolutionary method
HLA/RTI	high level architecture/runtime infrastructure
HPP	homogeneous Poisson process
HR	human resource
HTTP	hypertext transfer protocol

**I**

IC	inspection cost
ICOV	identify, characterize, optimize, verify
IDOV	identify, design, optimize, validate
IETF	internet engineering task force
IFM	inference functions for margins
IFR	increasing failure rate
i.i.d.	of independent and identically distributed
iid	independent identically distributed
IM	improvement maintenance
IT	information technology

**K**

KDD	knowledge discovery in databases
KGD	known good dies
KNN	<i>k</i> -nearest neighbors

**L**

LAC	lack of anticipation condition
LCEM	linear cumulative exposure model
LCF	lowest class first
LCL	lower control limits
LDA	linear discriminant analysis
LED	light emitting device
LIFO	last-in first-out
LLF	least loaded first
LLP	log-linear process
LMP	lack-of-memory property
LOC	lines of code
LOF	lack-of-fit
LPE	local pooled error

LQL	limiting quality level
LR	logistic regression
LSL	lower specification limit
LTi	low-turnaround-index
LTP	linear transportation problem

**M**

MAD	mean absolute deviation
MAD	median absolute deviation
MAPE	mean absolute percentage error
MARS	multivariate adaptive regression splines
MART	multiple additive regression tree
MC/DC	modified condition/decision coverage
MCF	minimum-cost-flow problem
MCMB	Markov chain marginal bootstrap
MCNR	Monte Carlo Newton–Raphson
MCS	Monte Carlo simulation
MCUSUM	multivariate cumulative sum
MDMSP	multidimensional mixed sampling plans
MDS	multiple dependent (deferred) state
MEP	minimum error pruning
MEWMA	multivariate exponentially weighted moving average
MGF	moment generating function
MILP	mixed integer linear programming model
ML	maximum-likelihood
MLDT	mean logistic delay time
MLE	maximum likelihood estimation
MME	method of moment estimates
MMSE	minimum mean squared error
MOLAP	multidimensional OLAP
MPDQ	multiple-priority dual queues
MPP	marked point process
MPP	multistage process planning
MRL	mean residual life
MS	mass spectrometry
MSA	measurement system analysis
MSE	mean square errors
MST	minimum spanning tree
MTBF	mean time before failure
MTBR	mean time between replacement
MTEF	marginal testing effort function
mTP	multiobjective transportation problem
MTS	Mahalanobis–Taguchi system
MTTF	mean time to failure
MTTR	mean time to repair
MVN	multivariate normal
MW	multiplicative Winter
MiPP	misclassification penalized posterior

**N**

NBM	nonoverlapping batch means
NHPP	nonhomogeneous Poisson process
NLP	nonlinear programming

NN	nearest neighbor
NPC	nutritional prevention of cancer
NTB	nominal-the-best case
NUD	new, unique, and difficult

**O**

OBM	overlapping batch means
OC	operating characteristic
OLAP	online analytical processing
OX	order crossover

**P**

PAR	phased array radar
PCB	printed circuit board
PDF	probability density function
pdf	probability density function
PEP	pessimistic error pruning
pFDR	proposed positive FDR
PH	proportional hazards
PID	proportional-integral-derivative
PLBI	package-level burn-in
PM	preventive maintenance
PMC	probabilistic model-based clustering
PMX	partial-mapped crossover
POF	physics-of-failure
PQL	penalized quasi-likelihood
PRM	probabilistic rational model
PRW	pro-rata warranty
PV	process variable

**Q**

QCQP	quadratically constrained quadratic programming
QDA	quadratic discriminant analysis
QFD	quality function deployment
QML	qualified manufacturing line
QSS	quick-switching sampling
QUEST	quick, unbiased and efficient statistical tree
QoS	quality of service

**R**

RBF	radial basis function
RCL	rate conservation law
RCLW	repair-cost-limit warranty
RD	Robust design
RED	random early-detection queue
REP	reduced error pruning
RF	random forest
RGS	repetitive group sampling
RIO	RED in/out
RNLW	repair-number-limit warranty

RP renewal process  
RPC remote procedure call  
RPN priority number  
RPN risk priority number  
RSM response surface method  
RSM response surface methodology  
RSM response surface models  
RTLW repair-time-limit warranty  
RV random variable

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**S**

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SA simulated annealing  
SAFT scale-accelerated failure-time  
SAM significance analysis of microarray  
SAR split and recombine  
SBI steady-state or static burn-in  
SCC special-cause charts  
SCFQ as self-clocked fair queueing  
SCM supply-chain management  
s.d. standard deviation  
SDLC software development life cycle  
SDP semidefinite program  
SE standard errors  
SEM structural equation models  
SES single-exponential smoothing  
SEV standard smallest extreme value  
SF survival function  
SIMEX simulation extrapolation  
SIPOC suppliers, inputs, process, outputs and customer  
  
SIRO service in random order  
SMD surface-mount devices  
SMT surface-mount technology  
SNR signal-to-noise ratios  
SOAP simple object access protocol  
SOF special operations forces  
SOM self-organizing maps  
SOM self-organizing (feature) map  
SPC statistical process control  
SQL structured query language  
SRGM software reliability growth models  
SRM seasonal regression model  
SSBB Six Sigma black belts  
SSE sum of squared errors  
SSM surface-to-surface missile  
STS standardized time series

SVM support vector machine  
SoS system of systems

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**T**

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TAAF test, analyse and fix  
TAES forecasting time series data that have a linear trend  
TCP transmission control protocol  
TCP/IP transmission control protocol/internet protocol  
TDBI test during burn-in  
TDF temperature differential factor  
TQM total quality management  
TS tracking signal  
TSP traveling-salesman problem

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**U**

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UBM unified batch mean  
UCL upper control limits  
UML unified modeling language  
USL upper specification limit

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**V**

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VOC voice of customer  
VSI variable sampling intervals  
VaR value at risk

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**W**

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WBM weighted batch mean  
WLBI wafer-level burn-in  
WLBT wafer-level burn-in and testing  
WLR wafer-level reliability  
WPP Weibull probability plot  
WRED weighted RED  
WRR weighted round-robin  
WSDL web services description language

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**X**

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XML extensible markup language

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**Y**

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Y2K year 2000