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List of Abbreviations

SAN = Same as new

SAO = Same as old

i.i.d = independent and identically distributed

HPP = Homogeneous poisson process

NHPP = Non-homogeneous poisson process

TRP = Trend renewal process

ARA = Arithmetic reduction of age

ARI = Arithmetic reduction of intensity

ARI₁ = Arithmetic reduction of intensity with memory 1

GRA = Geometric reduction of age

GRI = Geometric reduction of intensity

WPP = Weibull probability paper

MLE = Maximum likelihood estimator

$\ln L$ = log likelihood

AIC = Akaike information criterion

PLP = Power law process

SPLP = Superimposed power law process

PI = Proportional intensity

MTBF = Mean time between failures

ROCOF = Rate of occurrence of failures

FMEA = Failure modes and effects analysis

LHD = Load-haul-dump

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List of Symbols

$N(t)$ = Number of events in $(0, t]$ each event being a failure occurring at random

$A(t)$ = Cumulative intensity of the events up to time t

$\lambda(t)$ = Event intensity or rate of occurrence of events

$\lambda(t | H_{t^-})$ = Conditional event intensity or conditional rate of occurrence of events

H_{t^-} = The available data just prior to time t or the history of the process, the collection of all events observed on $[0, t]$

$T_{N(t^-)}$ = Time just prior to the last failure

$t - T_{N(t^-)}$ = Time since just prior to the last failure

λ = Scale parameter of the homogeneous poisson process

a = Scale parameter of the non homogeneous poisson process

β = Shape parameter of the non homogeneous poisson process

$\varepsilon(t)$ = Effective age of the unit / system

ϱ = Random variable representing degree of repair

$\lambda(t | H_{t^-}) = \lambda(t)f(\gamma'Z(t))$

$Z(t)$ = Time varying covariates

Z = Time invariant covariates

γ = Regression coefficients of the time varying covariates

τ = Location of change point

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