LIST OF SYMBOLS AND ABBREVIATIONS

Symbols

φ	-	Activation function.
AC_i	-	Actual value of i^{th} observation
$\bar{a}$	-	Average or mean for the attribute *a*
C1	-	Cognitive coefficient
Err_{ij}	-	Computed error for each node in TDNN
CurrE	-	Current Predicted Error
D	-	Dataset
g	-	Delay lag for each input sensor observation
Dτ	-	Dependency threshold
γ	-	Discount factor
Q	-	Duration universe
$Info(D)$	-	Entropy measure
$[x]_B$	-	Equivalence classes of the B-indiscernibility relation
P	-	Error universe
ES_i	-	Estimated value of i^{th} observation
$fRMSE_e(ws)$	-	Forecast error approximation value for ws^{th} segment
rand()	-	Function that generates random numbers
$\mu_N(Q)$	-	Fuzzy membership functions for duration
$\mu_E(P)$	-	Fuzzy membership functions for error
$\mu_C(S)$	-	Fuzzy membership functions for mean parameter

$\mu_M(R)$	-	Fuzzy membership functions for trend
$\mu_Z(T)$	-	Fuzzy membership functions for trend parameter
FS	-	Fuzzy set
N	-	Fuzzy sets of duration universe
E	-	Fuzzy sets of error universe
C	-	Fuzzy sets of mean parameter
Z	-	Fuzzy sets of the trend parameter
M	-	Fuzzy sets of trend universe
$gbest_i$	-	Global best position of i^{th} particle
$G_{t_{n+1}}(i)$	-	Growth rate for i^{th} attribute at time t_{n+1} using Wright enhanced double exponential smoothing
$Q_{t_{n+1}}(i)$	-	Growth rate for i^{th} clinical lab test at time t_{n+1} using Hanzak DES
IND ($B_{(T,S)}$)	-	Indiscernible relation or equivalence class
$I_j(t)$	-	Input of j^{th} node in time delay neural network
Y	-	Irregular time series
x_i	-	i^{th} object in the universe
a_k	-	k^{th} attribute in attribute set ; $a_k \in A$
$\lambda_t(S_t, a_t)$	-	Learning rate
$M_{t_{n+1}}(i)$	-	Level for i^{th} attribute at time t_{n+1} using wright enhanced double exponential smoothing
$a_{<L>}(x_i)$	-	Level of x_i for the attribute a
$pbest_i$	-	Local best position of i^{th} particle
$a_{t_{max}}$	-	Maximum duration of attribute ‘a’
$a_{<L>max}$	-	Maximum mean value for the attribute a
range_max	-	Maximum range of the search space
$a_{<b>max}$	-	Maximum trend value for the attribute a
a_{max}	-	Maximum value of attribute ‘a’
S	-	Mean parameter universe

$a_{<(L,b),\tau>}$	-	Mean and trend for attribute *a* with tolerance τ
rL_{t+1}	-	Mean at time *t+1*
$L_{t_{n+1}}$	-	Mean estimate for i[th] attribute at time t_{n+1} using fuzzy inference double exponential smoothing
$P_{t_{n+1}}(i)$	-	Mean value for i[th] clinical lab test at time t_{n+1} using Hanzak DES
$\mu < Decrease >^{(m_i)}$	-	Membership function for the fuzzy set decrease for i[th] input node.
$\mu < Increase >^{(m_i)}$	-	Membership function for the fuzzy set increase for i[th] input node.
$\mu < Stable >^{(m_i)}$	-	Membership function for the fuzzy set stable for i[th] input node.
$a_{t_{\min}}$	-	Minimum duration of attribute 'a'
MinE	-	Minimum Error tracker
$a_{<L>\min}$	-	Minimum mean value for the attribute *a*
range_min	-	Minimum range of the search space
$a_{<b>\min}$	-	Minimum trend value
$a_{\min}$	-	Minimum value of attribute 'a'
θ_j	-	Network bias
RQw_{ij}	-	Network weight adjusted using Q-learning
w_{ij}	-	Networks weight adjusted through back-propagation
h	-	Number of hidden nodes
$\lvert D_{j<T,S>}\rvert$	-	Number of records with attribute j^{th} trend T and state S in dataset *D*,
t_n	-	Observation at n[th] time point
$a(t_j)$ and $a(t_i)$	-	Observation period of x_i , x_j for the attribute a
$QW_t(S_t, a_t)$	-	Old Q-value
$O_j(t)$	-	Output from the j [th] hidden node

$\varepsilon_{(C,Q)}(R)$	-	Reduct approximation error
rY_t	-	Regular time series
Rs_i	-	Reinforcement signal
Ri_{t+1}	-	Reward value
ws	-	Segment number ,where 1<=ws<=k
Sg	-	Segment set
$sg_{b,e}(ws)$	-	Set of consecutive observations in ws^{th} segment within the appropriate boundaries 'b' and 'e'.
ρ	-	Significant value
α	-	Smoothing constant factor for level
β	-	Smoothing constant factor for trend estimation
$\alpha_{t_{n+1}}(i)$	-	Smoothing constant for level estimate of i^{th} attribute at time t_{n+1}
$f\alpha_{t_{n+1}}$	-	Smoothing constant for mean parameter at time t_{n+1}
$\alpha_{t_{n+1}}(i)$	-	Smoothing constant for the level of i^{th} attribute at time t_{n+1}
$\beta_{t_{n+1}}(i)$	-	Smoothing constant for the trend estimation of i^{th} attribute at time t_{n+1}
$\beta_{t_{n+1}}(i)$	-	Smoothing constant for trend estimate of i^{th} attribute at time t_{n+1}
$f\beta_{t_{n+1}}$	-	Smoothing constant for trend parameter
C2	-	Social component
r1, r2	-	Stochastic influence component.
B	-	Subset of knowledge A, $B \subseteq A$
X	-	Subset of universe $\mathbb{U}$, $X \subseteq \mathbb{U}$.
K	-	Temporal degree of dependency
$TGain(A)$	-	Temporal gain ratio
$Tinfo_{A<T,S>}(D)$	-	Temporal interpreted attribute split information

$\underline{B}_{(T,S)}X$	-	Temporal lower approximation
$POS_{B(T,S)}(Q)$	-	Temporal positive region
$tempTOL_{\tau}(B)$	-	Temporal tolerance
$SIM_{a<(x_i(t_i), x_j(t_j)),\tau>}$	-	Temporal tolerance similarity measure, for the attribute a and its i^{th} and j^{th} object observed at time t_i and t_j
τ	-	Tolerance factor
Lg_1 to Lg_8	-	Total forces observed from the eight sensors in left leg sensor
Rg_1 to Rg_8	-	Total forces observed from the eight sensors in right leg sensor
$\|D\|$	-	Total number of observations in dataset *D*
$b_{t_{n+1}}$	-	Trend estimate for i^{th} attribute at time t_{n+1} using fuzzy inference double exponential smoothing
$a_{k<(T,S)>}(x_i)$	-	Trend and state of i^{th} object for k^{th} attribute
rb_{t+1}	-	Trend at time *t+1*
$a_{<b>}(x_i)$	-	Trend of x_i for the attribute *a*
T	-	Trend parameter universe
R	-	Trend universe
$\mathbb{U}$	-	Universe which is a nonempty set of finite objects
$y_{t_r}(ws)$	-	Value measured at time t_r in the ws^{th} segment
$Y_{t_n}(i)$	-	Value of i^{th} attribute at time t_n
$a(x_i), a(x_j)$	-	Value of x_i, x_j for the attribute a
$a<(x_i(t_i), x_j(t_j)), \tau>$	-	Value of x_i, x_j for the attribute at time t_i and t_j ,
V_i	-	Velocity of the i^{th} particle

Abbreviations

ANFIS	-	Adaptive neuro-fuzzy inference system
ABN	-	Artificial biochemical networks
ANN	-	Artificial neural networks
AR	-	Autoregressive model
BP	-	Backpropagation
CDMS	-	Clinical decision making system
DT	-	Decision tree
DES	-	Double exponential smoothing
ECG	-	Electrocardiography
EEG	-	Electroencephalography
EMG	-	Electromyography
EHR	-	Electronic health records
FeAB	-	Forecast-error approximation based bottom-up
FOG	-	Freezing of gait
FIML	-	Full information maximum likelihood
FNN	-	Fuzzy neural network
GP	-	Gaussian process
GLG	-	Generalized lasso granger
GRNN	-	Generalized regression neural networks
GD	-	Gradient descent
GDM	-	Gradient descent with momentum
HRV	-	Heart rate variability
HMM	-	Hidden Markov model
HD	-	Hot-deck
IDW	-	Inverse distance weight
KLS	-	Karmalegosification
KNN	-	K-nearest neighbor
LM	-	Levenberg-marquardt

LDS	-	Linear dynamical system
LSP	-	Lomb-scargleperiodogram
ML	-	Maximum likelihood
MID	-	Medical identity
MPTP	-	Minimal predictive temporal patterns
MAR	-	Missing at random
MCAR	-	Missing completely at random
MNAR	-	Missing not at random
MUAPT	-	Motor unit action potential trains
MLP	-	Multi-layer perceptron
MALM	-	Multiple abstraction level mining
NB	-	Naïve bayes
NLR	-	Negative likelihood ratio
NPV	-	Negative predictive value
NN	-	Neural network
NFIS	-	Neuro-fuzzy inference system
NFKN	-	Neuro-fuzzy Kolmogorov's network
NICU	-	Neurological intensive care unit
PD	-	Parkinson's disease
PSO	-	Particle swarm optimization
PIP	-	Perceptually important points
PAA	-	Piecewise aggregate approximation
PLR	-	Piecewise linear representation
PPV	-	Positive predictive value
PKDD	-	Principles and practice of knowledge discovery in databases
PNN	-	Probabilistic neural network
Q-BTDNN	-	Q-backpropagated time delay neural network
Q-BP	-	Q-backpropagation
SOM	-	Self-organizing map

SDA	-	Shape description alphabet
SDS	-	Significant data selection
SGP	-	Sliding window genetic programming
STRiD	-	Statistical tolerance rough set induced decision tree
SVM	-	Support vector machine
SAX	-	Symbolic aggregate approximation
TD4C	-	Temporal discretization for classification
TRiNF	-	Temporal rough set induced neuro-fuzzy
TDNN	-	Time delay neural networks
TIRP	-	Time intervals related pattern
TSKR	-	Time series knowledge representation
TRiBS	-	Tolerance rough set induced bio-statistical
TNR	-	True Negative Rate
TPR	-	True Positive Rate
VGRF	-	Vertical ground reaction force