CERTIFICATION

This is to certify that the thesis entitled "**An Integrated Framework for COVID and Pneumonia Disease Prediction using Optimized Deep Learning Models**" submitted to the Avinashilingam Institute for Home Science and Higher Education for Woman, Coimbatore, for the award of the degree of **Doctor of Philosophy in Computer Science**, is a record of original research work done by **Ms. S. R. Kalaiselvi (19PHCSP004)**, during the period of her study in the Department of Computer Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, under my supervision and guidance and the thesis has not formed the basis for the award of any Degree / Diploma / Associateship / Fellowship or Seminar title to any candidate of any University.

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DECLARATION

I hereby declare that the thesis titled "**An Integrated Framework for COVID and Pneumonia Disease Prediction using Optimized Deep Learning Models**" is the result of investigations carried out by me in the Department of Computer Science, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore, under the supervision and guidance of **Dr. R. Vijayabhanu**, Associate Professor, Department of Computer Science, Avinashilingam Institute for Home Science and Higher Education for Woman, Coimbatore, and that it has not been submitted for the award of any Degree / Diploma / Associateship / Fellowship or similar title of any University or Institute.

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KALAISELVI S R

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LIST OF ABBREVATION AND SYMBOLS

ABBREVIATIONS		DESCRIPTION
ALRTOHE	-	Additive Log Ratio Transformed One Hot Encoding
BAS	-	Beetle Antennae Search
Bi-LSTM	-	Bi-direction a Long Short-Term Memory
CKD	-	Chronic Kidney Disease
CNN	-	Convolutional Neural Network
DCML	-	Deep Contrastive Mutual Learning
DCML	-	Deep Contrastive Mutual Learning
DM	-	Data Mining
DMFL_Net	-	Decision-Making-Basis Federated Learning Network
DSPM	-	Deep Sequential Prediction Model
DSVM	-	Deep Support Vector Machine
DWS-CNN	-	Depth Wise Separable Convolution Neural Network
EPBC	-	Emphasis Perceptron Boosting Classification
ES	-	Exponential Smoothing
IoT	-	Internet of Things
LASSO	-	Least Absolute Shrinkage and Selection Operator
LR	-	Linear Regression
ML	-	Machine Learning
MO-UNetDL	-	Memetic Optimized U-Net Deep Learning
MTGP	-	Multi-Task Gaussian Process
NFR	-	Novel Feature Reduction
SARS-CoV-2	-	Severe Acute Respiratory Syndrome Coronavirus 2
NRM	-	Non-parametric Regression Model
NSPPS	-	Nonlinear Sammon Projective Pattern Selection
RBV	-	Routine-Blood-Values
RPN	-	Region Proposal Network
SCTPP-FS	-	Statistical correlative targeted projection pursuit-based feature selection
SVM	-	Support Vector Machine
TCLMCNL	-	Time-dependent Cox regressive Levenberg–Marquardt Convolutional Neural Learning
TSIDFE	-	Tversky Similarity-Indexed Distributive Feature Embedding
ZMFNE	-	Zero Mean Feature Normalized Encoding
A_o	-	Actual results
D_s	-	Standard deviation
E_r	-	Error rate
FS_{acc}	-	Feature Selection accuracy
F_{st}	-	Feature selection time
L_h	-	Loss
Mem_{psd}	-	Number of patient data samples from dataset

ABBREVIATIONS	DESCRIPTION
Nd_{cp}	- Number of data correctly preprocessed
Ndf_{cs}	- Number of data feature correctly selected
Ndf_i	- Number of data feature samples involved in the simulation process for disease prediction
Nd_{ip}	- Number of data samples incorrectly preprocessed
$Nf_{11}, Nf_{12} \ldots, Nf_{1n}$	- Normalized numerical value of the features
P_{Acc}	- Preprocessing accuracy
P_o	- Predicted classification outputs
P_{time}	- Preprocessing time
S_c	- Space complexity
T_{df}	- Total number of data features
a_i	- Input attribute
$f_i - f_j$	- Variance between the two features
$f_i(t)$	- Input features
$f_i \cap f_j$	- Mutual dependence between the two features
f_n	- False negative
f_p	- False positive
$g_o(t)$	- Covariate vector
m_f	- Mean of the particular feature value
q_{input}	- Weight
ρ_c	- Regression coefficient
$*$	- Convolutional operator
Z	- Output of pooling layer
B	- Binary representation
D	- Bias whose value is ‘1’
Fs	- Feature scaling
LL	- Cross-entropy loss
M	- Mean of the attribute
NBR	- Numeric to binary representation
NF	- Normalized feature matrix
$O(A)$	- Observed accuracy
$P(A)$	- Proportion of probable accuracy by chance
$P(t)$	- Hidden layer output
PAC	- Prediction accuracy
$PTime$	- Prediction time
Pre	- Precision
R	- Cramér's phi correlation function
Rec	- Recall
Td	- Total number of data
$Time\ [sdf]$	- Time for single data feature selection
$Time[psd]$	- Sample data
$Y\ (t)$	- Hazards function at times
$argmin$	- Argument of the minimum function

ABBREVIATIONS	DESCRIPTION
b	- Output in a matrix form
n	- Number of samples
tn	- True negative
tp	- True positive
δ	- Similarity coefficient
δ	- Threshold
σ	- Deviation