



# Codon-mRNA prediction using deep optimal neurocomputing technique (DLSTM-DSN-WOA) and multivariate analysis

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## ABSTRACT

Based on the principle that the upgrading of any nation begins by raising the level of performance of its institutions that serve the community, including the Ministry of Healthcare and given the development in the field of technology, and the growing need to save the life of persons from different types of diseases and determined the proteins that increase or prevent any diseases, so it is found that the world has tended in recent years to intelligent data analysis techniques spatially deep neurocomputing in healthcare fields to predict high quality results in short time. The paper presents model to Codon-mRNA Prediction using Deep Optimal Neurocomputing Technique (DLSTM-DSN-WOA) and Multivariate Analysis. That model consists of five basic stages: The first stage is the process of collecting and preparing the data to make it in suitable form for the decision-making stage and included several steps, including the processing of missing values and condign the target, the second stage involved develop optimization algorithms called Whale Optimization Algorithm (WOA) to build optimal structure to one of the deep neurocomputing network (i.e., long short-term memory (LSTM)). That tool select after deep analysis achieve on optimization algorithms include PSO, BOA, WOA, COA, and FA; this analysis focus on determined for points: the main programming steps, main parameters, advantages, and disadvantages for each algorithm. . The WOA used to find the best structure of deep neurocomputing technique called LSTM that choose to develop after campier among multi techniques (i.e., Recurrent Neural Network (RNN), Gated Recurrent Unit (GRU), Long Short-Term Memory (LSTM), Bi-Directional Long Short-Term Memory (BiLSTM), and AlexNet, GoogleNet). That campier perform based on the programing steps and main parameters affect in each algorithm, because WOA as algorithm having many advantages and characteristics. The proposed model appears as pragmatic intelligent data analysis model for reduce the computation and time of handle huge real data.

## 1. Introduction

Deep learning is most powerful machine learning techniques that includes several layers to help computer learns on its own ability without human effort. deep learning presented about 1980s, it was relatively unpopular for, a number of years due to insufficient computational infrastructure, also limited datasets. Modern computer vision, speech recognition programs, and future prediction are all, products of deep learning. Sub models, which are structured in the form of layers stacked on top of each other, can be used to train successive layers of representations (supervised or unsupervised) in deep learning. With the drop in popularity of traditional neural networks, deep networks have just lately made a huge comeback by delivering amazing outcomes in many different areas [1].

Neurocomputing as known artificial neural networks (ANN), has become a hot topic in the computing world due to its ability to learn from data. because of the dynamic nature and variations of real-world problems data DL models are successfully applied in various area of fields, including healthcare, visual identification, text analytics, and cyber security. parameter of Neuro computing selected by try error principle [2], [3].

Optimization can be defined as the method that helps to find the best values according to type of objective function for determined problem [4]. The problem includes maximized or minimized some function related to some set, such minimal cost, maximum profit, minimal error, optimum design and optimal management. The basic three elements of optimization which are decision variables, objective, and constraints. the classification of optimization problem related problem related to

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