

# Abstract

One of the important solutions in designing the architecture of a dynamic neural network is the use of suitable activation functions in the hidden layers of the network. This function and its derivative play an important role in the backpropagation algorithm and the calculation of the gradient of the cost function is based on the output of the activator function. In recent years, many efforts have been made by deep neural network developers to design new activator functions to be a more effective and efficient alternative to traditional activator functions. In this thesis, an attempt has been made to examine the properties, functions and applications of different types of activator functions in a neural network and to describe the latest research achievements in this field. Finally, we model a deep neural network on a practical problem with laboratory data recorded by the Shahid Bagheri Center of the Self-Sufficiency Jihad Organization of the Islamic Revolutionary Guard Corps, whose purpose is to authenticate wireless devices using radio fingerprints. is After designing the network architecture, using different activator functions in the hidden layers of the network, network performance has been evaluated and the best activator function has been selected for effective and efficient network.