

1110-41-10

**George A Anastassiou\*** ([ganastss@memphis.edu](mailto:ganastss@memphis.edu)), George Anastassiou, Dept. of Mathematical Sciences, U. Memphis, Memphis, TN 38152. *Approximation and Interpolation by Neural Network Operators.*

Here we introduce some general interpolating neural network operators in the univariate and multivariate cases. Initially we establish the interpolation property of the operators on functions. Then we derive the approximation properties of these operators on functions. We prove first the ordinary real quantitative pointwise and uniform convergences of these operators to the unit. Smoothness of functions is taken into consideration and speed of convergence improves dramatically. As extensions we consider also the fractional, fuzzy, fuzzy-fractional, fuzzy-random, complex and iterated cases. Furthermore we give Voronovskaya type asymptotic-expansions at all studied settings for the errors of related approximations. (Received November 20, 2014)