

A Review on the Potential Use of Neural Networks for the Mechanical Characterization of Materials (With a Focus on Biocomposites)

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Biocomposite materials are complex natural / manmade objects that are developed through the fusion of two or more different materials, one of which is a biological reinforcer and the other is the polymer matrix component. Due to their complex nature, “in silico” characterization of the biocomposite material is multifaceted and often results in a complex set of computation that requires heavy amount of parallel processing. Parallel processing although complex for applications, is natural for Neural Networks in regards to systems analysis and modeling. Neural networks today are successfully being used in many different areas ranging from neuron vision, neuron control, different neural hardware etc. (Gupta et al., 2003). They often provide better results than conventional algorithms, models or processes due to their massively parallel processing ability. There are different types of neural networks, based on learning capability, adaptation, self organization ability etc. Neural network tools used specifically in the characterization of biological materials is a novel area. Neural Network based computational tools are able to categorize and map data based on the input provided and allows the fine modeling of composites and provides predication of materials that are essentially shrouded with complex mechanical, physical and rheological properties. Use of neural network provides advancement in the direction of characterizing biological materials and composites.