

**BACKPROPAGATION NEURAL NETWORK
TRAINING ALGORITHM ANALYSIS**

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ABSTRACT

Neural network is a mathematical model or computational model that is inspired by the structure and/or functional aspects of biological neural networks. Backpropagation, or propagation of error, is a common method of teaching artificial neural networks how to perform a given task. There is several training algorithm that can be used to compute a neural network problem.

Concrete is a composite construction material composed of cement (commonly Portland cement) and other cementitious materials such as fly ash and slag cement, aggregate (generally a coarse aggregate made of gravels or crushed rocks such as limestone, or granite, plus a fine aggregate such as sand), water, and chemical admixtures.

This paper presents the analysis of Backpropagation Neural Network Training Algorithms in Artificial Neural Network (ANN) using MATLAB and demonstrates the analysis of training algorithms using the dataset of concrete compressive strength.

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CHAPTER 1

INTRODUCTION

1.1 PROBLEM STATEMENT

The extraordinarily rapid development of the electronic computer has invigorated human curiosity about the working of the brain and the nature of the human mind. The availability of the computer as a research tool has tremendously accelerated scientific progress in many fields which are important for a better understanding of the brain, such as neuroscience, psychology, cognitive science, and computer science. AI is concerned with making the computer behaves like a human and focusing on creating computer systems that can engage on behaviours that humans consider intelligent.

An Artificial Neural Network (ANN) is an information processing paradigm that is inspired by the way biological nervous systems, such as the brain, process information. The key element of this paradigm is the novel structure of the information processing system. It is composed of a large number of highly interconnected processing elements (neurons) working in unison to solve specific problems [1]. Neural networks are also intuitively appealing, based as they are on a crude low-level model of biological neural systems. In the future, the development of this neurobiological behaviour may lead to genuinely intelligent computers [2]. Backpropagation was created by generalizing the Widrow-Hoff learning rule to multiple-layer networks and nonlinear differentiable transfer functions [3].

Concrete is widely used in domestic, commercial, recreational, rural and educational construction. Communities around the world rely on concrete as a safe, strong and simple building material. It is used in all types of construction, from domestic work to multi-storey office blocks and shopping complexes [4].

Concrete is a composite construction material that is composed of cement and other materials such as fly ash and slag cement, aggregate, water, and chemical admixtures [5]. Concrete mixtures can be designed to provide a wide range of mechanical and