

## Public Abstract

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Developing Neural Network Applications Using LabVIEW

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Artificial Neural Networks (ANN) have gained tremendous popularity over the last few decades. They are considered as substitutes for many classical techniques which have been followed for many years. Some of the most common applications of ANN are pattern recognition, pattern classification, plant modeling and control, and image compression. Many neural network architectures have been developed so far. ANN models have the capability to use more than one learning algorithm for training purpose. Different aspects of ANN such as efficiency, speed, accuracy, dependability and the like have been studied extensively. Many approaches have been suggested to improve the performance of neural nets.

In this thesis, a new approach has been proposed to build neural net architectures. LabVIEW is graphical programming software developed by National Instruments. Using LabVIEW, ready-made Virtual Instruments (VI) can be developed for various applications. It is basically an Application Development Environment (ADE) for building user friendly applications. This thesis concentrates on LabVIEW approach to build various neural net structures. The learning algorithms used by these neural nets also vary according to the requirements and application. The main emphasis is on the development of neural net applications in a LabVIEW environment. This thesis focuses on three areas of applications – Pattern Classification, Image Compression, and Plant Modeling.