Abstract for Artificial Neural Networks Tutorial
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Artificial Neural Networks (ANNs) are a versatile and important family of statistical tools that can be employed when rule-based programming models are not feasible or required. Some examples of the wide range of problems ANNs can be applied to include: computer vision, handwriting recognition, autonomously flying aircraft, forecasting energy consumption, image compression and lung cancer triage. The current interest and activity around the concept of Deep Learning, which uses ANNs, implies they are still relevant, important and will be used into the foreseeable future.

There isn't a single, global definition for what an Artificial Neural Network is, but most definitions allude to a basic ANN as a nonlinear statistical learning algorithm that functions as a universal approximator for an unknown function or functions.

The aim of this tutorial is to educate the audience on how a basic ANN works, mainly by discussing the mechanics of a single layer feed forward artificial network. This presentation will explain the various layers to an ANN and show what is happening in the units (or neurons) that belong to the various levels. This presentation walks the audience through the weighted sums involved in unit calculation, the activation function (sigmoid) and the concept of learning, or updating the weights of the ANN.

This tutorial will also cover higher level facts about ANNs: common usage and positive and negative features of ANNs. By the end of this tutorial an audience member should be knowledgeable about what is going on inside the "black box" of an ANN as well as have a general sense of the types of problems for which ANNs are well suited and the limitations of choosing ANNs as a method.