

Artificial Neural Networks for Data Analysis

The increasing volume of data traffic in a wide range of businesses and technologies requires high-throughput analysis techniques. Machine Learning methods have found widespread use both in applied technologies and in scientific research, and the next generation of scientists with a focus on mathematical modeling will benefit from these tools. In this lecture, I will briefly discuss a particular application of artificial neural networks, which can be used to analyze scientific data in a way similar to pattern recognition. Specifically, we will look at how neural networks can be trained with pre-computed data to recognize certain behaviors in magnetic materials and how they can then recognize the type of magnetic material from the way it responds to external fields. In order to obtain a basic understanding of how certain mathematical operations are performed in a neural network, you will need to participate during the talk. We will perform some basic calculations to understand how a convolutional neural networks work and we will design a network architecture and test it live.