BYTE QUEST

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Contents:

Byte Quest is the article published by the CSE dept of Vasavi College of Engineering regarding the latest innovative Technologies and Software that have been emerged in the competitive world. The motto of this article is to update the people regarding the improvement in technology. The article is designed by the active participation of students under the guidance of faculty coordinators.

 Good, bad or indifferent if you are not investing in new technology, you are going to be left behind.

-Philip Green

 Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road.

-Stewart Brand

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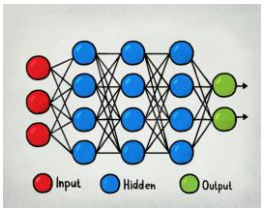
NEURAL NETWORKS

A neural network is a series of algorithms that endeavors to recognize underlying relationships in a set of data through a process that mimics the way the human brain operates. In this sense, neural networks refer to systems of neurons, either organic or artificial in nature. Neural networks can adapt to changing input; so the network generates the best possible result without needing to redesign the output criteria. The concept of neural networks, which has its roots in artificial intelligence, is swiftly gaining popularity in the development of trading systems. A neural network contains layers of interconnected nodes. Each node is a perceptron and is similar to a multiple linear regression. The perceptron feeds the signal produced by a multiple linear regression into an activation function that may be nonlinear.

A neural network evaluates price data and unearths opportunities for making trade decisions based on the data analysis. The networks can distinguish subtle nonlinear interdependencies and patterns other methods of technical analysis cannot. According to research, the accuracy of neural networks in making price predictions for stocks differs. Neural networks will be the technology of the future due to their wide range of applications.



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FINGER VEIN RECOGNITION

Finger vein recognition is a method of biometric authentication that uses pattern-recognition techniques based on images of human finger vein patterns beneath the skin's surface. Finger vein recognition is one of many forms of biometrics used to identify individuals and verify their identity. Finger vein ID is a biometric authentication system that matches the vascular pattern in an individual's finger to previously obtained data. Hitachi developed and patented a finger vein ID system in 2005. The technology is currently in use or development for a wide variety of applications, including credit card authentication, automobile security, employee time and attendance tracking, computer and network authentication.

To obtain the pattern for the database record, an individual inserts a finger into an attester terminal containing an LED light and a monochrome charge-coupled device camera. The haemoglobin in the blood absorbs near-infrared LED light, which makes the vein system appear as a dark pattern of lines. The camera records the image and the raw data is digitized, certified and sent to a database of registered images.

ALEKHYA (CSE-B 2/4)

A SMALL ARTIFICIAL HAND

The technology merges two concepts from two different fields. Implementing them both together had never been done before for robotic hand control, and contributes to the emerging field of shared control in neuroprosthetics. One concept, from neuro engineering,involves deciphering intended finger movement from muscular activity on the amputee's stump for individual finger control of the prosthetic hand which has never before been done. The other, from robotics, allows the robotic hand to help take hold of objects and maintain contact with them for robust grasping."When you hold an object in your hand, and it starts to slip, you only have a couple of milliseconds to react," explains Aude Billard who leads EPFL's Learning Algorithms and Systems Laboratory. "The robotic hand has the ability to react within 400 milliseconds. Equipped with pressure sensors all along the fingers, it can react and stabilize the object before the brain can actually perceive that the object is slipping. "

The algorithm first learns how to decode user intention and translates this into finger movement of the prosthetic hand. The amputee must perform a series of hand movements in order to train the algorithm that uses “Machine Learning”. Sensors placed on the amputee's stump detect muscular activity, and the algorithm learns which hand movements correspond to which patterns of muscular activity. Once the user's intended finger movements are understood, this information can be used to control individual fingers of the prosthetic hand."Because muscle signals can be noisy, we need a machine learning algorithm that extracts meaningful activity from those muscles and interprets them into movements," says Katie Zhuang first author of the publication.Next, the scientists engineered the algorithm so that robotic automation kicks in when the user tries to grasp an object. The algorithm tells the prosthetic hand to close its fingers when an object is in contact with sensors on the surface of the prosthetic hand. This automatic grasping is an adaptation from a previous study for robotic arms designed to deduce the shape of objects and grasp them based on tactile information alone, without the help of visual signals. Many challenges remain to engineer the algorithm before it can be implemented in a commercially available prosthetic hand for amputees. For now, the algorithm is still being tested on a robot provided by an external party.

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