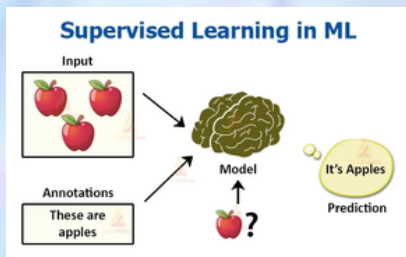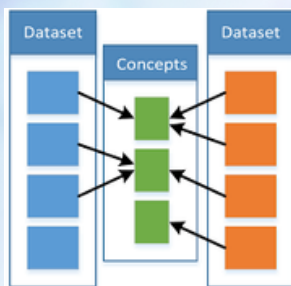# MAGAZINE

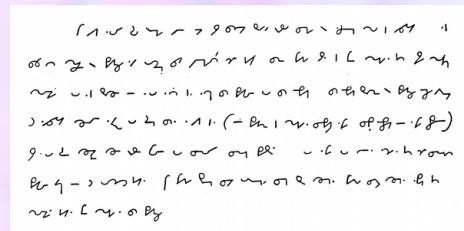# Byte Quest

Department of CSE

SUPERVISED LEARNING

HOLOGRAPHIC TECHNOLOGY

MULTIMODAL LEARNING

STENOGRAPHY

Department Vision

To be a center for academic excellence in the field of Computer Science and Engineering education to enable graduates to be ethical and competent professionals.

Department Mission

To enable students to develop logic and problem solving approach that will help build their careers in the innovative field of computing and provide creative solutions for the benefit of society.

FACULTY COORDINATORS

S. KOMAL KAUR
(ASST. PROFESSOR)
T. NISHITHA
(ASST. PROFESSOR)

STUDENT COORDINATORS

CHANDRASHEKAR (2/4) CSE B
ANISHA (4/4) CSE B
AKASH (3/4) CSE C

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SUPERVISED LEARNING

Machine learning is a core sub-area of artificial intelligence; it enables computers to learn without being explicitly programmed. One of the machine learning techniques is supervised learning. Supervised machine learning is the construction of algorithms that are able to produce general patterns and

hypotheses by using externally supplied instances to predict the fate of future instances. Supervised machine learning classification algorithms aim at categorizing data from prior information. In supervised learning problems, we start with a data set containing training examples with associated correct labels.
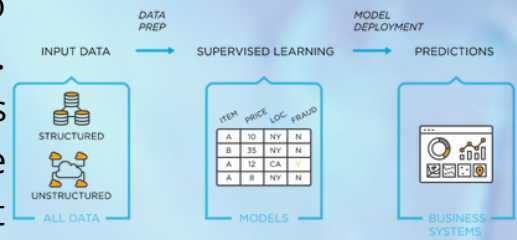
HOLOGRAPHIC TECHNOLOGY

In real life, holograms are virtual three-dimensional images created by the interference of light beams that reflect real physical objects. Holograms preserve the depth, parallax, and other properties of the original item. They are great for presenting complex technical concepts as well as showcasing visually appealing products.

So, **how do holograms work?** Holography is a unique method of photography whereby 3D objects are recorded using a laser and then restored as precisely as possible to match the originally recorded object. When illuminated via a laser, holograms are able to form an exact 3D clone of the object and duplicate its features. In order to produce an accurate visualization of a hologram at a certain point in space, two light waves must be coordinated in motion - a reference wave and an object wave. Both are formed by separating the laser beam. The reference wave is created directly by the light source, and the object wave is reflected from the recorded object. There is also a photographic plate on which dark stripes are "imprinted" depending on the distribution of electromagnetic energy (interference) in a given place.

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MULTI MODAL LEARNING

Deep learning is a new area of machine learning research that imitates the way the human brain works. It has a great number of successful applications in speech recognition, image classification, and natural language processing. It is a particular approach to build and train neural networks. A deep neural network consists of a hierarchy of layers, whereby each layer transforms the input data into more abstract representations.
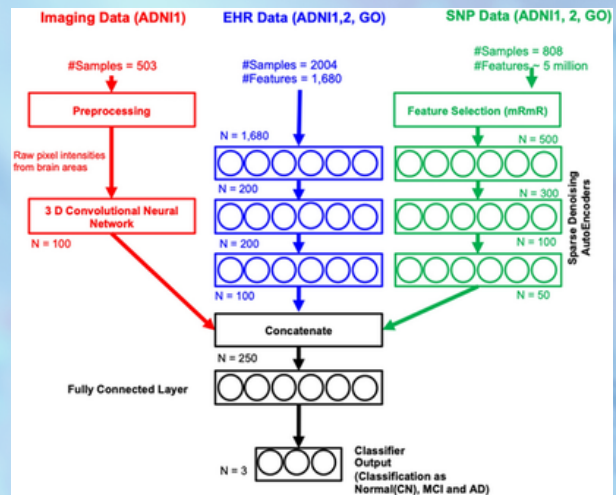

Deep networks have been successfully applied to unsupervised and supervised feature learning for single modalities like text, images or audio. As the developments in technology, an application of deep networks to learn features over multiple modalities has surfaced. It involves relating information from multiple sources. The relevance of multi-modality has enhanced tremendously due to extensive use of social media and online advertising. Social media has been a convenient platform for voicing opinions from posting messages to uploading a media file, or any combination of messages. There are a number of methods that can be used for multimodal deep learning, but the most efficient one is DeepBoltzmann Machine (DBM). The DBM is a fully generative model which can be utilized for extracting features from data with certain missing modalities. DBM is constructed by stacking one Gaussian RBM and one standard binary RBM. An RBM has three components: visible layer, hidden layer, and a weight matrix containing the weights of the connections between visible and hidden units. There are no connections between the visible units or between the hidden units. That is the reason why this model is called restricted.

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STENOGRAPHY

Steganography is an ancient practice. When spies in the Revolutionary War wrote in invisible ink or when Da Vinci embedded secret meaning in a painting that was steganography. This works in the digital world, too, where a file like an image can be stealthily encoded with information. For example, pixel values, brightness, and filter settings for an image are normally changed to affect the image's aesthetic look.
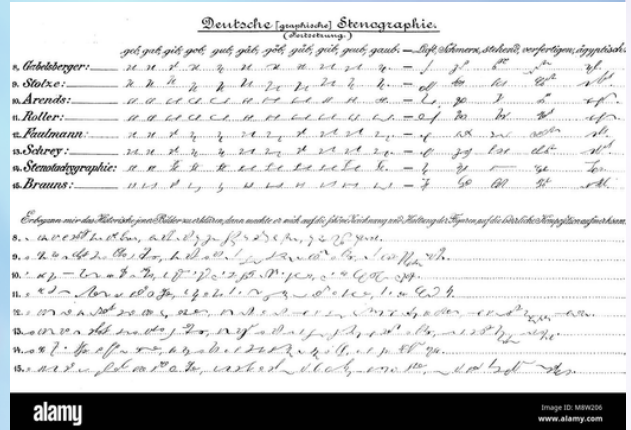
But hackers can also manipulate them based on a secret code with no regard for how the inputs make the image look visually. This technique can be used for ethical reasons, such as to evade censorship or embed messages in Facebook photos. But these methods can also be used nefariously. For security defenders the question is how to tell the difference between an image that's been modified for legitimate reasons and one that's been changed to secretly contain malicious information. With the rapid advancement of smart mobile devices, the need to protect valuable proprietary information has generated a plethora of new methods and technologies for both good and evil.

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