***Computer Vision-***

**Introduction-** In modern day and age, along with various technological advancements Computer vision has found its way into a very relevant and effective role. Computer Vision allows a device to get, Human Vision like attributes. It allows the device to figure out relevant information from digital images, videos and other visual inputs using deep learning. Human vision is similar to computer vision but human vision benefits from lifetimes of context to teach it how to distinguish objects apart, how far away they are, whether they are moving, and whether something is incorrect with an image.

Computer vision teaches computers to execute similar tasks, but using cameras, data, and algorithms rather than retinas, optic nerves, and a visual cortex, it must do it in a fraction of the time. Because a system trained to check items or monitor a production asset can assess hundreds of products or processes per minute, detecting faults or issues that are invisible to humans, it can swiftly outperform humans.

**Then and Now-** Computer vision has come a long way since its introduction in 1959 with the transformation of images into grid of numbers, in 2001 the Viola-Jones algorithm and now to Convolutional Neural Network.

In earlier stages the objects were searched for, using RGB values of the object while checking through each pixel. The object with the most resembling RGB value was considered as the object. But it had many drawbacks like, this model was completely useless if any other object with same RGB values were present nearby or if any the lighting conditions were bad.

Thus, a model was developed in which each pixel was compared to the adjacent pixel and a certain pixel multiplication was done(the product is also known as Kernels). Then each Kernels was convulated, that is they were collectively considered and then the object was figured.

But, now CNN (Convulated neural network) and RNN(Recurrent Neural Network) are used. CNN works against labeled data i.e. the huge sets of data which are present in the database regarding the object which we are looking for. It uses convulation, just like the previous model. Convulational neural networks aren’t required to be many layers deep, but they usually are, in order to recognize complex objects and scenes. That’s why the technique is considered DEEP LEARNING. The process includes dividing the image into smaller groups of pixels, which are called filters. This filters are compared against each other in the similar way as kernel formation and convulation. RNN is advanced form of CNN and it works on moving images like Videos etc.

**Difficulties faced n implementing computer vision-**

The major difficulty in implementing computer vision is, the large sets of data, which are needed to cross check with, for finding the objects. This is a typical difficulty faced by most of the deep learning algorithms.

**Implementation-**

Computer vision has changed, humans perceive the world. It is now implemented in day to day life, eg:- snapchat filters, instagram reels etc. It has found its use in self-driving cars and agricultural fields. With more advancement in this areas, Computer vision is expected to reach new heights!