**Air Canvas-Drawing in Air using AI.**

**Abstract:**

In the study of visual pattern recognition, Abstract-Drawing in Air has been one of the most fascinating and challenging research fields. In this context, visual pattern recognition refers to the ability to spot finger-tip movement. In a variety of applications, it enhances human-computer interaction. With the help of this concept, human-computer interaction will become more naturally seamless (HCI). The proposed approach performs two primary functions: first, it tracks the fingertip; second, it shows the fingertip's coordinates on the screen in any specified color. Instead of a camera, there is no need for a keyboard, a pen, or a glove. The standard flat-dimensional, rectangular, and empty (white) canvas used in traditional artworks is something that this concept of Air Canvas goes beyond. To create this project, we're using OpenCV and computer vision techniques. This project uses the fingertip tracking and detection procedure to accomplish its purpose. It is advised specially in during COVID-19 situation or any critical weather conditions to draw virtually on an air canvas using hand gestures without touching anything. For the deaf, the especially abled, the elderly, and youngsters, this initiative will be a potent means of communication for educational reasons.

**Introduction:**

Modern technology has advanced to such a degree that "HUMAN COMPUTER INTERACTION" has come to play an increasingly significant role in our daily lives. The traditional form of writing is being overtaken by digital art in the age of the internet. Digital art refers to methods of artistic expression and dissemination using digital media. One of the defining features of the digital manifestation is its reliance on modern science and technology. Traditional art refers to the kind of art that was developed prior to digital art. It can be easily broken down into visual art, audio art, audio-visual art, and audio-visual imaginary art, which encompasses literature, painting, sculpture, architecture, music, dance, theatre, and other works of art, depending on who is doing the analysis. Traditional and digital art are interdependent and related to one another. Although social progress is not a result of popular demand, basic human necessities nonetheless serve as the primary inspiration. In art, the same thing takes place. In the circumstances at hand, we need to thoroughly grasp the fundamental differences in form between digital art and conventional art because they are both inclusive of the symbiotic condition. The writing methods that are traditionally used include chalk and a board and a pen. The primary goal of digital art is to develop a system for hand motion recognition so that digital writing may be done. There are numerous different ways to write in digital art, including utilizing a keyboard, touch-screen surface, digital pen, stylus, electronic hand gloves, etc. However, in this system, hand gesture detection is used in conjunction with a machine learning algorithm and python programming to produce a natural interface between the human and the machine. To develop this AI based Project, we will be using our trending techniques namely OpenCV and Python. Open cv is mainly known as an open-source computer vision and machine learning software.

**Problem Statement:**

Hand gesture recognition is incredibly challenging task in the computer vision field. In this field you required detection and explanation of certain movements and poses of the hands. The goal of this research is to develop a healthy and accurate system for hand gesture recognition using computer vision techniques. In this research, the system should be able to detect and classify accurately for different hand movements in real phase of time. Also, system should be performed in various condition and in different viewpoints. In this research we aim to improve the performance for hand recognition system and try to make them more universally applicable in fields such as gaming, sign language reorganization.

**Project scope:**

The project focuses on creating a motion-to-text converter that may one day act as software for intelligent wearables that enable writing from the air and can be used to good effect. This endeavor serves as a reporter of infrequent gestures. The finger's route will be traced using computer vision. Messages, emails, and other types of communication can all be sent using the created text. The deaf will be able to effectively communicate thanks to it. It is an efficient means of communication that decreases the use of mobile devices and laptops by doing away with the need to write. In the era of digital world, traditional art of writing is being replaced by digital art. Digital art refers to forms of expression and transmission of art form with digital form. Relying on modern science and technology is the distinctive characteristics of the digital manifestation. Traditional art refers to the art form which is created before the digital art. From the recipient to analyze, it can. simply be divided into visual art, audio art, audio-visual. art and audio-visual imaginary art, which includes literature, painting, sculpture, architecture, music, dance, drama and other works of art. Digital art and traditional art are interrelated and interdependent. Social development is not a people’s will, but the needs of human life is the main driving force anyway. The same situation happens in art. In the present circumstances, digital art and traditional art are inclusive of the symbiotic state, so we need to systematically understand. the basic knowledge of the form between digital art and traditional art. The traditional way includes pen and paper, chalk, and board method of writing. The essential aim of digital art is of building hand gesture recognition system to write digitally. Digital art includes many ways of writing like by using keyboard, touch-screen surface, digital pen, stylus, using electronic hand gloves, etc. But in this system, we are using hand gesture recognition with the use of machine learning algorithm by using python programming, which creates natural interaction between man and machine. With the advancement in technology, the need of development of natural ‘human – computer interaction (HCI)’ [10] systems to replace traditional systems are increasing rapidly.