Course Outline

**Overview:**

In today's fast-paced developing environment, artificial intelligence has proven to have a significant impact on human life. The rapid advancement of technology has allowed the digital world to interact with visuals. The digital images generated by cameras and videos provide a plethora of opportunities for training the machines to analyze the real-time movement of objects.

The advancement in the field of computer vision has enabled us in detecting crimes, accidents, medical conditions such as brain tumors, and so on more efficiently, thus ultimately assisting domain experts in making better and more efficient decisions.

We have designed this Pre-Work for Computer Vision course to help you learn how to deal with image-based datasets, understand the various aspects of an image that must be considered when building models, and lay a solid foundation in computer vision. This course will prepare you on how to approach image-based datasets and business problems, extract relevant details from images, as well as familiarize you with various libraries that are widely used in the industry.

The *Pre-Work for Computer Vision* course is a prerequisite for the next course *Introduction to Computer Vision*. It is critical that you thoroughly go through the content of this week and practice along with the instructor so you are well prepared to take on the computer vision concepts without any hassle.

**Course Objectives:**

After completing this course, you will be able to:

* Understand the representation of images as multidimensional arrays.
* Understand different modules like PIL, OpenCV to work with images.
* Understand the concepts of detecting edges in an image.
* Understand the core concepts of CNN like filters, padding, strides, and Pooling.
* Implement the core concepts of CV using Tensorflow, and Keras.

**Course Content:**

The content covers the concepts that serve as prerequisites for understanding concepts of the sequential implementation of CNN. We will cover the following concepts:

* Introduction to Computer Vision and Applications of Computer Vision Today.
* Representation of images as multi-dimensional arrays.
* Working with images using PIL and OpenCV.
* The emergence of Convolution and Edge Detection.
* Introduction to core concepts of CNN-Filters, Padding, Strides, and Pooling.
* Implementation of FIlters, Padding, Strides, and Pooling using Tensorflow and Keras.
* Flattening the output feature map of convolutional layers into a 1d vector.

**Prerequisites:**

* Participants are expected to have knowledge of python programming, data manipulation & steps of the model building using machine learning and Deep Learning.
* Participants are expected to be comfortable with installing Python packages and reading the documentation of different packages.
* Participants are expected to know about ANN and the implementation of ANN in TensorFlow and Keras

**We hope you have a good time with Convolutional Neural Networks.**

**Happy Learning!**