**MUST Academy: Computer Vision session:**

Hour 1: Getting started with computer vision (Introduction and Setup – 10 mins)

1. Images as Functions and Matrices. (10 mins)
2. Mathematical operations with images (15 mins)
3. Image Filtering (10 mins)
4. Noises In Images (5 mins)
5. Image Transformations (8 min)

Challenge 1 – *Creating transparent pencil sketch portraits from original images.*

Break – 2 mins

Hour 2: Computer Vision ImageOps

1. Edge Detection (15 mins)
2. Colour Masking (5 mins)
3. Template Matching (10 mins)
4. Shape Detection (15 mins)

Challenge 2 – *Traffic Sign Detector from animated and real-world images*.

Break – 5 mins

1. Hour 3 – Computer Vision ImageOps 2
2. Convolution vs Correlation (10 mins)
3. Image Boundary Issues (10 mins)
4. Image Binarization (10 mins)
5. Image Morphology (10 mins)

Challenge 3 – *Localization of bar codes and QR codes in images.*

Break – 5 mins

Hour 4 – Exploring the world of deep learning

1. Introduction to CNNs (10 mins)
2. Multi-Class Classification using Images (15 mins)
3. One shot learning for face detection (15 mins)
4. Advanced computer vision deep learning concepts – Neural Style Transfer and GANs (10 mins)

Challenge 4 - *Brain haemorrhage segmentation from CT Scan Images using Mask RCNN*

End Note – 5 mins