**Literature Survey**

Edwin Jose, Greeshma M, Mithun Haridas T. P, “Face Recognition based Surveillance System Using FaceNet and MTCNN on Jetson TX2”2019 5th International Conference on Advanced Computing & Communication Systems (ICACCS)

* Authors proposed system for face detection and recognition of human faces using embedded graphic card Jetson TX2 in IP camera, Models used by the authors are MTCNN and Facenet.

Rehmat Ullah , Hassan Hayat, Afsah Abid Siddiqui, Uzma Abid Siddiqui, Jebran Khan, Farman Ullah, Shoaib Hassan, Laiq Hasan, Waleed Albattah , Muhammad Islam, and Ghulam Mohammad Karami, “A Real-Time Framework for Human Face Detection and Recognition in CCTV Images” 2022 Hindawi Mathematical Problems in Engineering

* Authors proposed a CCTV based face recognition system which recognize single face from Image using PCA, CNN and KNN and it required average of 30 images for each face before classifying accurately

Paul Viola, Michael J. Jones, “Robust Real-Time Face Detection” July 11, 2003 International Journal of Computer Vision

* Authors proposed Machine Learning algorithm for face detection known as Cascade Classifiers, it trains the AdaBoost classifiers in Cascade manner and underlying Stumps classify Haar like features that is created using another intelligent algorithm, used to create Integral Image for quick computation. Integral Image together with Cascade Classifier make computation efficient and robust. This algorithm is best suited for real-time face detection

Kaipeng Zhang, Zhanpeng Zhang, Zhifeng Li, Senior Member, IEEE, and Yu Qiao, Senior Member, IEEE, “Joint Face Detection and Alignment Using Multitask Cascaded Convolutional Networks” October 10, 2016 IEEE SIGNAL PROCESSING LETTERS, VOL. 23

* Authors proposed Deep learning algorithm for face detection on different alignment of face. Multitask Cascaded Convolutional Networks is enhanced version of Cascade Classifier uses three different layers of CNN for detection of faces. First layer uses P-Net or Proposal Network for obtaining candidate and their bounding box regression, Second layer uses R-net or Refine Network which rejects large number of false candidates and perform calibration of bounding box regression and Third layer uses O-net or Overall Network for describing face in more detail and five facial landmarks position. Each layer uses 3 loss function, First loss function uses cross entropy-loss for face classification, Second loss function uses Euclidean loss for bounding box regression and Third loss function also uses Euclidean loss for Facial landmark localization