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Machine Learning (CSE 475)
Project Report : Person identification from realtime videos

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1 Description

We built a realtime person recognition system using OpenCV and Convolutional Neural Network Github Link

2 Process

2.1 Dataset preparation

For our project we chose two famous actors.

1. Chris Evans
2. Robert Downey jr

Because there is a lot of images we can take from there online presences. We choose many of the interviews they given on various online networks and youtube channel. We took only frontal image part using 'haarcascade_frontalface_default.xml' file, a built-in file in openCV. We collected about 15,000 images of 2 classes, 7500 each.The interviews that we took data from can be found here.And the dataset we created can be found here.

2.2 Model creation

To train this dataset we have bult a model using CNN.The architechture of the model is given below.

Layer(Type)	Output Shape	Total Number of parameters
conv2d (Conv2D)	(None, 28, 28, 32)	320
max pooling2d (MaxPooling2D)	(None, 14, 14, 32)	0
conv2d 1 (Conv2D)	(None, 12, 12, 64)	18496
max pooling2d 1 (MaxPooling2D)	(None, 6, 6, 64)	0
conv2d 2 (Conv2D)	(None, 4, 4, 128)	73856
max pooling2d 2 (MaxPooling 2D)	(None, 2, 2, 128)	0
dropout (Dropout)	(None, 2, 2, 128)	0
flatten (Flatten)	(None, 512)	0
dense (Dense)	(None, 128)	65664
dropout 1 (Dropout)	(None, 128)	0
dense 1 (Dense)	(None, 3)	387

Table 1: Architecture of Model.

2.3 Data preprocessing

1. Random Schuffling
2. Separation of input and output
3. Label Binarization
4. Corverting data to Numpy array
5. Reshaping of input array

2.4 Model training

Loss Function: catagorical cross entropy

Optimizer: Adam

Epoch : 20

Batch size : 32

2.5 Model Testing and Results

To test our model we ran 3 videos into our model. One is only for class of Chris evans and other two are for downey jr and them combined.Here are the results.

3 Future Work

With large scale dataset and using more computational power we can built more powerfull system that can take attendance from a classroom automatically and can identify a criminal from a CCTV footage.