**Readme**

1. The Python packages required to run the codebase are written in “requirement.txt.” The required Python version is 3.8.
2. The raw CSI dataset files are in “/WN\_tut/rawcsi”. It contains two files named “mayank\_ISA.csv” and “mayank\_relation.csv.”
3. The codebase file is “assignment.ipynb”. All the code snippet and instruction to run the code is written in it. Follow the instructions and complete the code. Use Jupyter Notebook or vscode, etc., to run the codebase file.
4. The trained model is “best\_atten\_400nodes.hdf5”. Use this model to recognize the different head gesticulations.

Note: The engagement score for the mayank\_ISA.csv dataset is more than 70%, and for the mayank\_relation.csv dataset, it is more than 85%

def hampel\_filter(input\_matrix):

input\_matrix= np.asarray(input\_matrix)

n = input\_matrix.shape[1]

print(n)

new\_matrix = np.zeros\_like(input\_matrix)

k = 1.4826 # scale factor for Gaussian distribution

n\_sigmas=1

length = len(input\_matrix)

length = int(length/2)

window\_size=length # change the value here

for ti in range(n):

start\_time = max(0, ti - window\_size)

end\_time = min(n, ti + window\_size)

x0 = np.nanmedian(input\_matrix[:, start\_time:end\_time], axis=1, keepdims=True)

s0 = k \* np.nanmedian(np.abs(input\_matrix[:, start\_time:end\_time] - x0), axis=1)

mask = (np.abs(input\_matrix[:, ti] - x0[:, 0]) > n\_sigmas \* s0)

new\_matrix[:, ti] = mask\*x0[:, 0] + (1 - mask)\*input\_matrix[:, ti]

new\_matrix = pd.DataFrame(new\_matrix)

return new\_matrix