

# MSc Project 2021

Title: Estimating personality in communication  
Name: Yuichi Midorikawa

weekX

This indicates when it was done

X-X

This corresponds to the mindmap number

Time Plan		Oct				Nov					Dec	My Progress	
Step	Task	4	11	18	25	1	8	15	22	29	6	Status	Question (res/No)
		week1	week2	week3	week4	week5	week6	week7	week8	week9	week10		
1	capture a dataset that contains people talking and the text of what they say.	1					buffer				buffer	Finished	
	1-1. Find a dataset to use	1-1										Finished	
2	using the conversation text, do sentiment analysis (A)	2										Finished	
	2-1. Find a model to use	2-1										Finished	
	2-2. Using the model and its data set, perform sentiment analysis		2-2									Finished	
3	from the videos, extract people and body pose (B)	3										Finished	
	3-1. Find a model to use	3-1										Finished	
	3-2. Using the model and its data set, extract body pose		3-2									Finished	
4	from the head, extract facial feature points (C)	4										Finished	
	4-1. Find a model to use	4-1										Finished	
	4-2. Using the model and its data set, extract facial points		4-2									Finished	
5	Then train a model to predict (A) from (B)+(C)			5								Finished	
	5-1. Predict (A) from (B) body pose			5-1								Finished	
	5-2. Predict (A) from (C) facial feature points			5-2								Finished	
	5-3. Predict (A) from (B) body pose + (C) facial feature points			5-3								Finished	
6	evaluate and analyse the results.				6							Running	
	6-1. Decide a evaluation metrics				6-1							Finished	
	6-2. evaluate and analyse the results					6-2						Running	
7	Write a paper					7						Running	

# Time plan for writing my dissertation

Chapter	What should I write?			Nov					Dec	My P	week9
				1	8	15	22	29	6		
	Level 1	Level 2		week5	week6	week7	week8	week9	week10	Status	
1	Introduction								Buffer	Draft	
		• Briefly explain the context of the project problem								Draft	
		• Specify overall aim and objectives and report structure								Draft	
2	Analysis/ Requirements									Draft	
		• Problem Statement								Draft	
		• Background Survey/Analysis								Draft	
		• Effectively combine above in one chapter								Draft	
3	Design & Implementation									Draft	
		• Discuss the main features of your design and how it evolved								Draft	
		• In your implementation part								Draft	
4	Testing&Evaluation									Draft	
		• Describe how you evaluated your solution/product								Draft	
		• Summarise the evaluation results, and use them to critically evaluate your own work								Draft	
		• Be honest about any shortcomings								Draft	
5	Conclusion									Running	
		• Describe the status of your research/product								Running	
		• Summarize what you have achieved								Running	
		• Compare to what you originally set out to achieve								Running	
		• Relate your work to relevant previous work								Running	
		• Suggest further/future work that you think would be worthwhile								Running	
6	Bibliography									Running	
		• List, in alphabetical order by author and date, all articles that you have consulted								Running	
		• Use consistent style								Running	
		• Collect all the details when you access a document first								Running	

week9

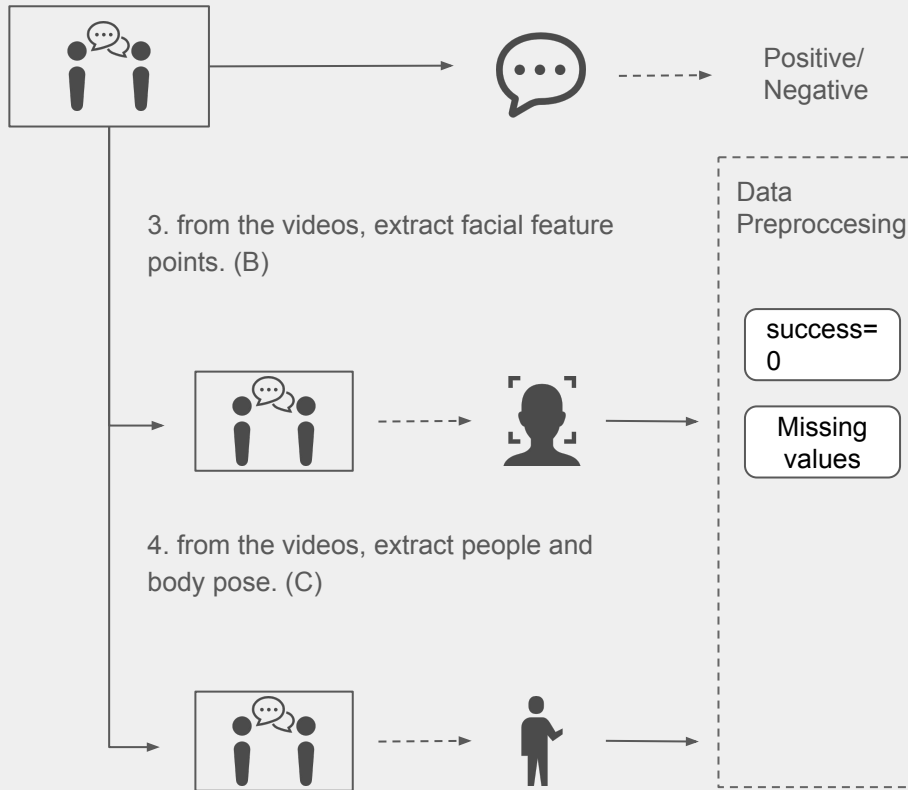
## Data Preparation

1. capture a dataset that contains people talking and the text of what they say.

2. using the conversation text, do sentiment analysis. (A)

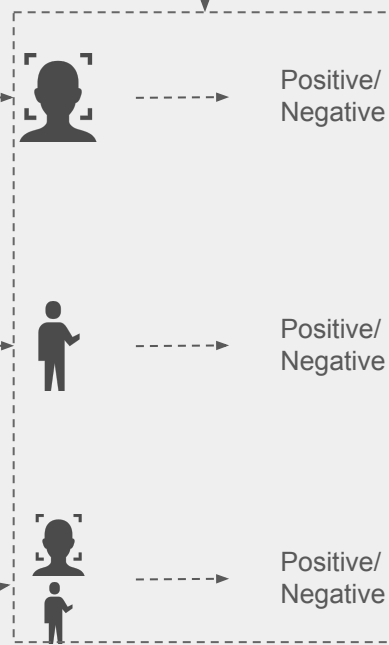
3. from the videos, extract facial feature points. (B)

4. from the videos, extract people and body pose. (C)



## Implementation

5. train a model to predict (A) from (B), (C) and (B) + (C)



## Evaluation

6. evaluate and analyse the results.

Evaluation Metrics

Accuracy

Precision

Recall

F1 Score

# 1. Summary of actions agreed during last meeting

1-1. I have improved model for predicting emotions using a 3-layer NN model (Pytorch)

1. Facial features ([OpenFace](#))

1-2. Dissertation: I have written a draft version of Chapter 4 ([Evaluation part](#))

1-3. Observed and visualised the data for the report

- Explore examples of correct/incorrect predictions
- Visualise trends in confidence for each frame

## 1-1. Created the model and predicted emotions from facial features.

I predicted emotions from facial features and body pose features using 3 layers NN with Pytorch. I tried to apply the Softmax function.

Model	Accuracy	
	LogisticRegression()	3 layers NN (using Pytorch)
OpenFace	61.56%	79.99%
OpenPose	71.47%	68.57%
OpenFace+OpenPose	To Be Updated	

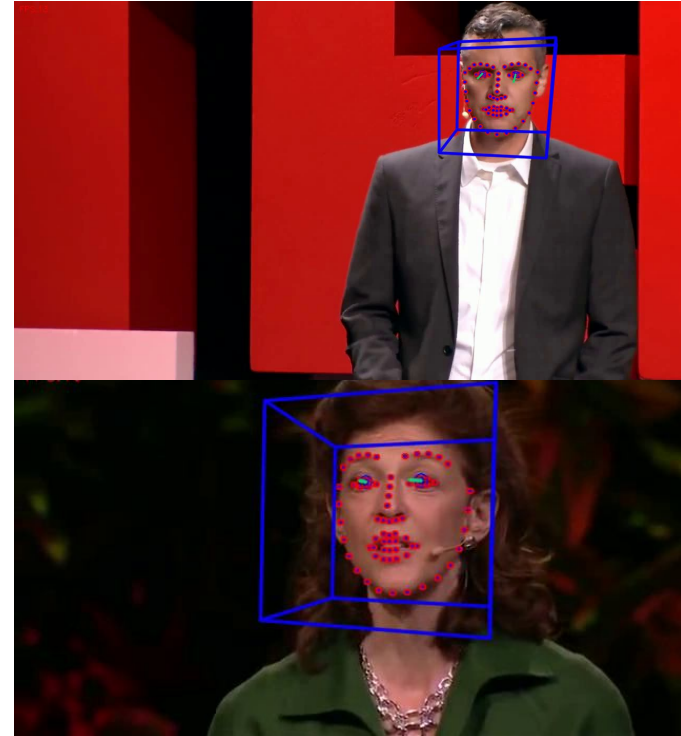
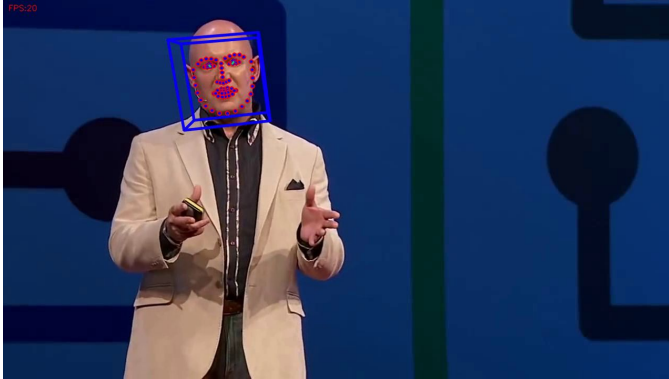
I am currently unable to merge the OpenFace and OpenPose csv files due to a memory crash on my environment.

→ Next Actions: Using Pandas :concat() or Numpy:concatenate()

## 1-3. Observed and visualised the data for the report

I was trying to analyse examples of correct/incorrect predictions.

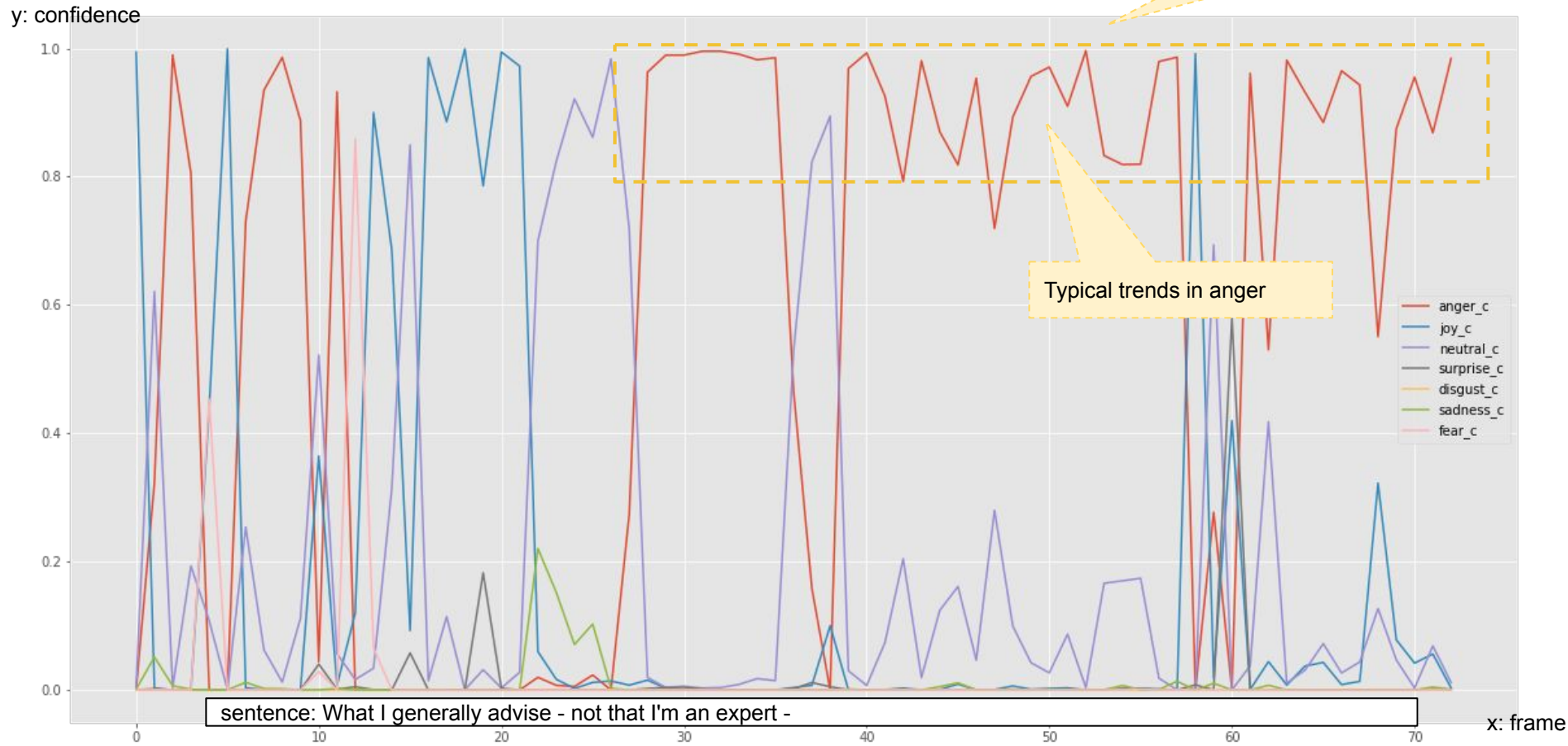
If the prediction is correct - anger



# 1-3. Observed and visualised the data for the report

'anger' accounts for 60% of the total

anger





## 2. Summary of work done & results this week

2-1. I have created models for predicting emotions. ([Ekman](#), [Grouping](#))

1. Facial features ([OpenFace](#))
2. Body Pose features ([OpenPose](#))
3. Facial features + Body Pose features ([OpenFace](#) + [OpenPose](#))

2-2. Observed and visualised the data for the report

- Explore examples of correct/incorrect predictions
- Visualise trends in confidence for each frame

2-3. Dissertation: I have written a draft version of Chapter 4 ([Testing/ Evaluation part](#))

# 1-1. Created the model and predicted emotions from facial features

I predicted emotions from (a) facial features, (b) body pose features and (a) + (b).

Model	Accuracy				
	Logistic Regression()	Random Forest()	3 layers NN (using Pytorch)		
			Epoch 100	Epoch 300	Epoch 600
(a) OpenFace	61.45%	67.78%	67.05%	72.69%	77.04%
(b) OpenPose	59.93%	72.33%	67.28%	70.03%	67.81%
(a)+(b)OpenFace+OpenPose	<b>62.27%</b>	<b>79.52%</b>	<b>79.77%</b>	<b><u>82.04%</u></b>	<b>82.01%</b>

# 1-1. Created the model and predicted emotions from facial features

I predicted emotions from (a) facial features, (b) body pose features and (a) + (b).

Model	Accuracy				
	Logistic Regression()	Random Forest()	3 layers NN (using Pytorch)		
			Epoch 100	Epoch 300	Epoch 600
(a) OpenFace	79.62%	92.21%	81.29%	85.34%	87.06%
(b) OpenPose	78.86%	94.60%	79.16%	82.91%	85.15%
(a)+(b)OpenFace+OpenPose	<b>80.14%</b>	<b><u>96.32%</u></b>	<b>91.52%</b>	<b>93.62%</b>	<b>93.40%</b>

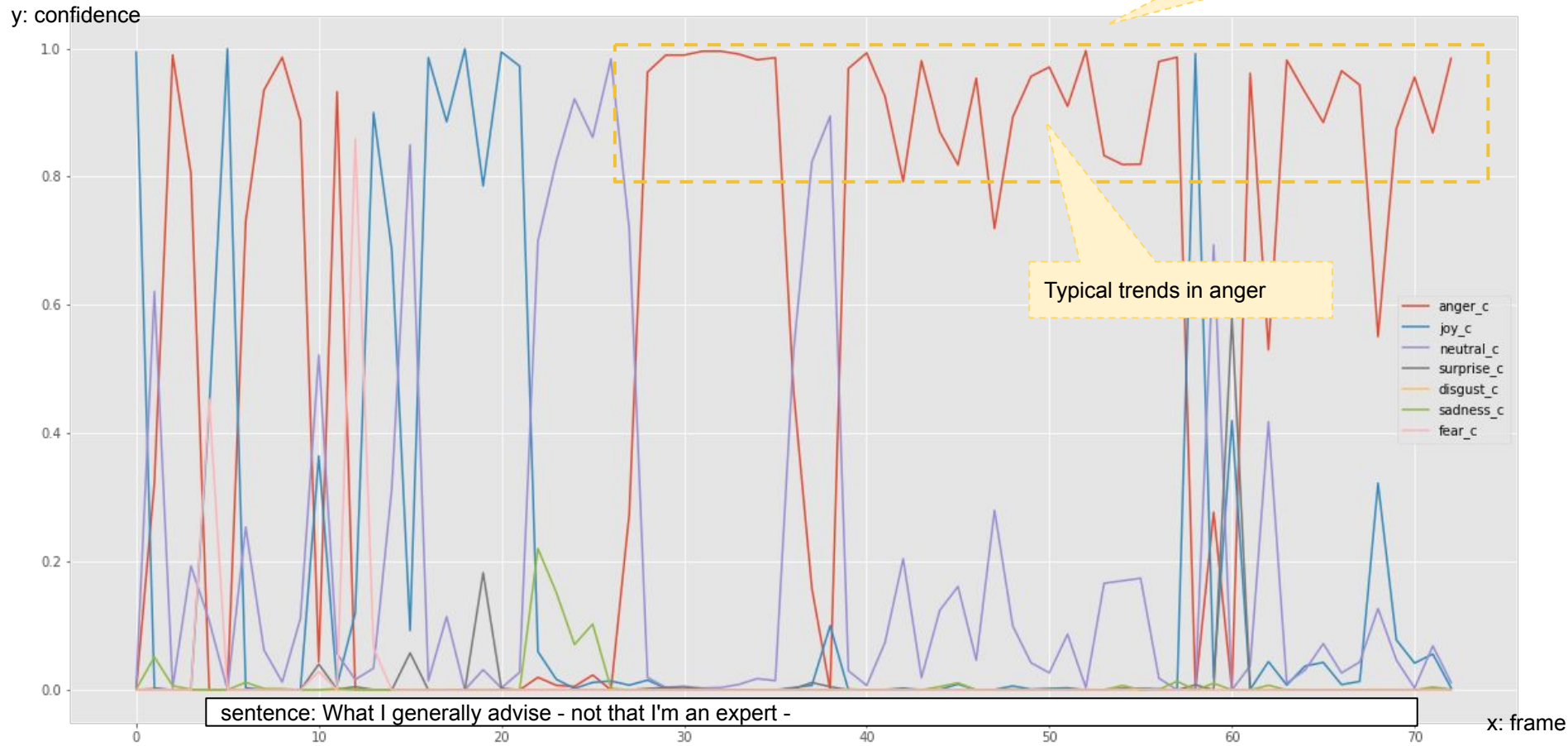
### 3. Questions to be discussed during the meeting

3-1. Could you advise me on the visualisation and observation of the following graph?

# 1-3. Observed and visualised the data for the report

'anger' accounts for 60% of the total

anger



## 4. Proposed objectives for next week

4-1. Observed and visualised the data for the report

- Explore examples of correct/incorrect predictions
- Visualise trends in confidence for each frame

4-2. Dissertation: Write a draft version of Chapter 5 ([Conclusion](#)) & I will complete my dissertation.

## 5. Articles read this week

5-1. Do Bodily Expressions Compete with Facial Expressions? Time Course of Integration of Emotional Signals from the Face and the Body

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3720771/>

5-2. Body Movement: Coping with the Environment

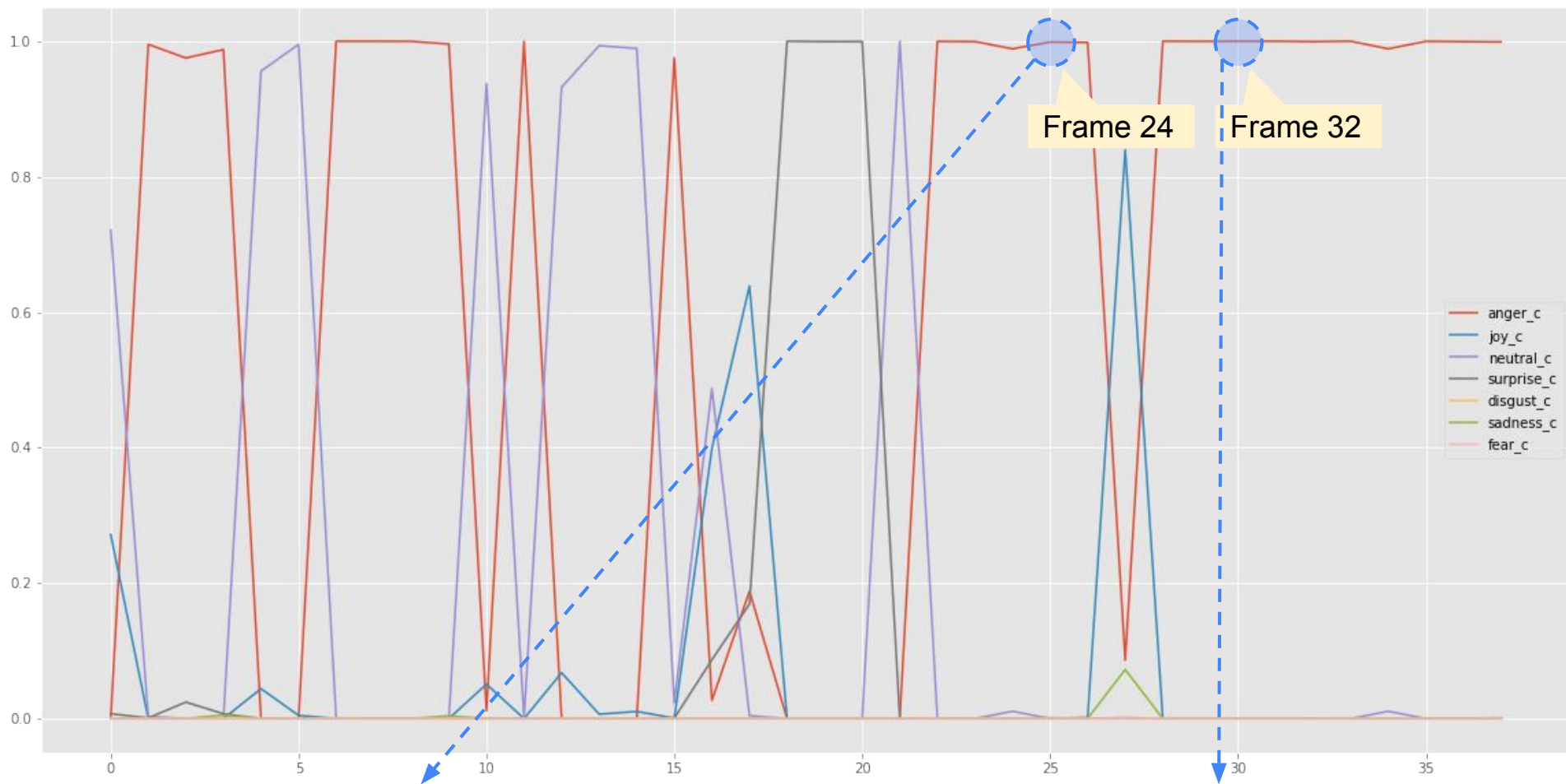
<https://www.semanticscholar.org/paper/Body-movement%3A-Coping-with-the-environment%3A-Irmgard-Arnheim/a9cce77241cd9a6f7eedda4c61ea437a8096d195>

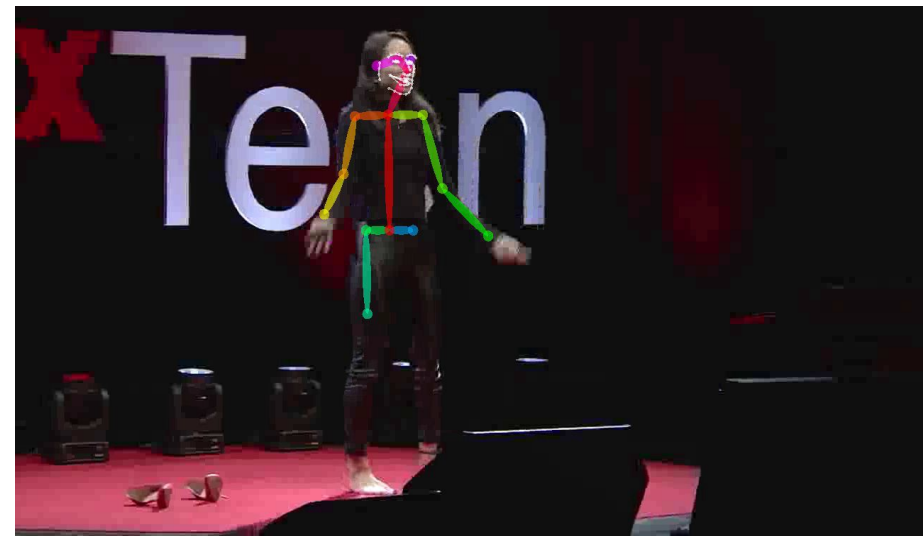
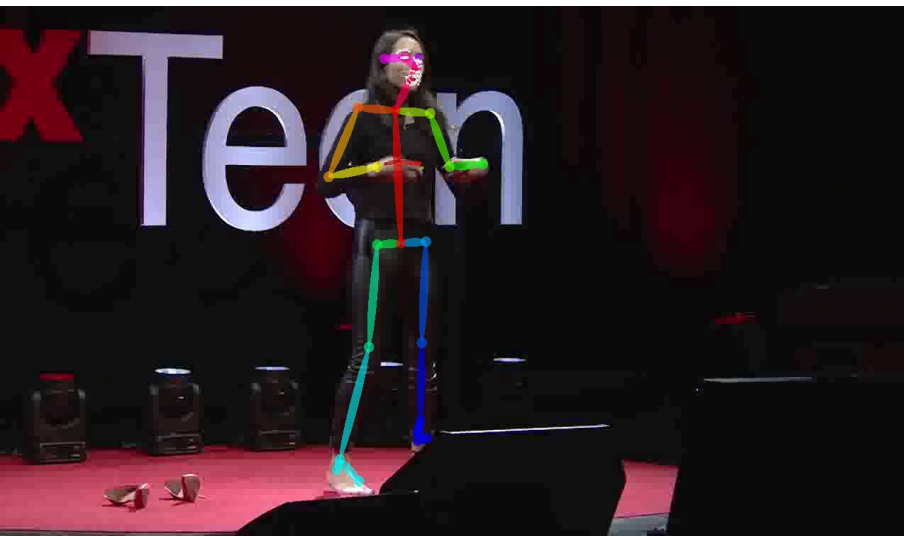
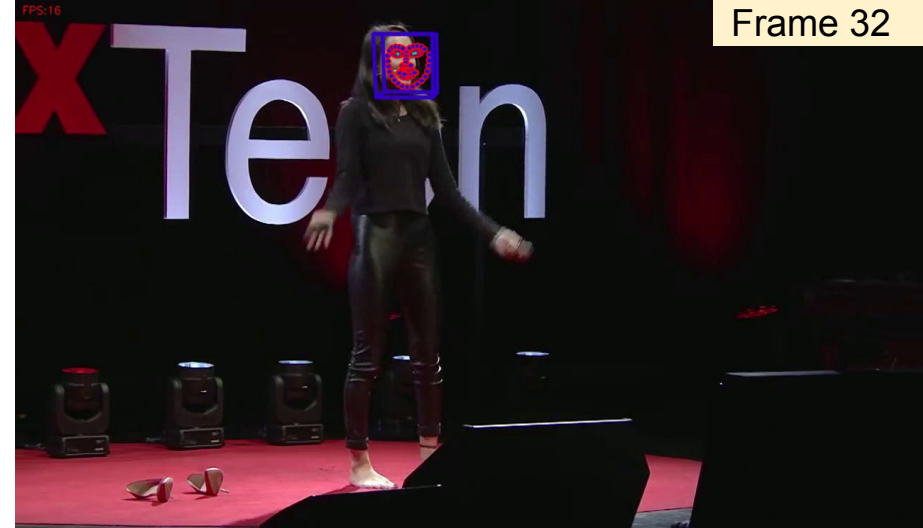
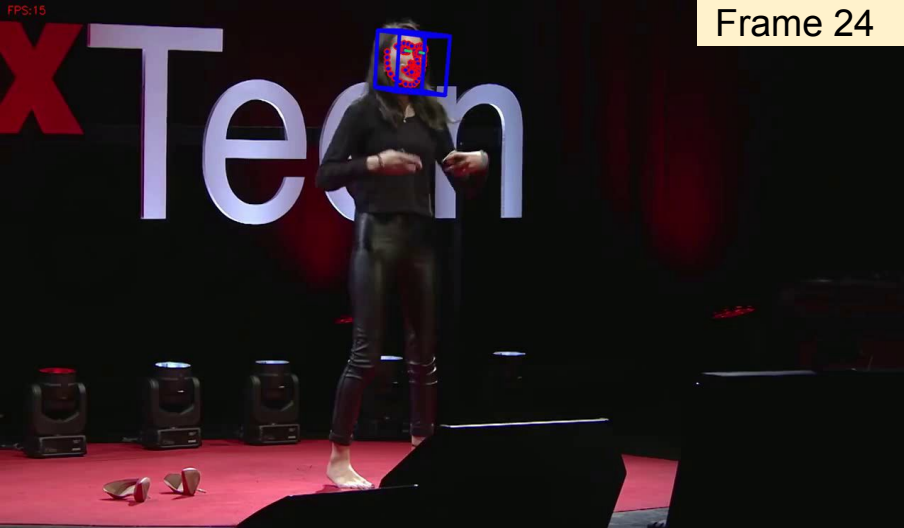
5-3. Attributing Emotion to Static Body Postures: Recognition Accuracy, Confusions, and Viewpoint Dependence

[https://www.researchgate.net/publication/226206444\\_Attributing\\_Emotion\\_to\\_Static\\_Body\\_Postures\\_Recognition\\_Accuracy\\_Confusions\\_and\\_Viewpoint\\_Dependence](https://www.researchgate.net/publication/226206444_Attributing_Emotion_to_Static_Body_Postures_Recognition_Accuracy_Confusions_and_Viewpoint_Dependence)

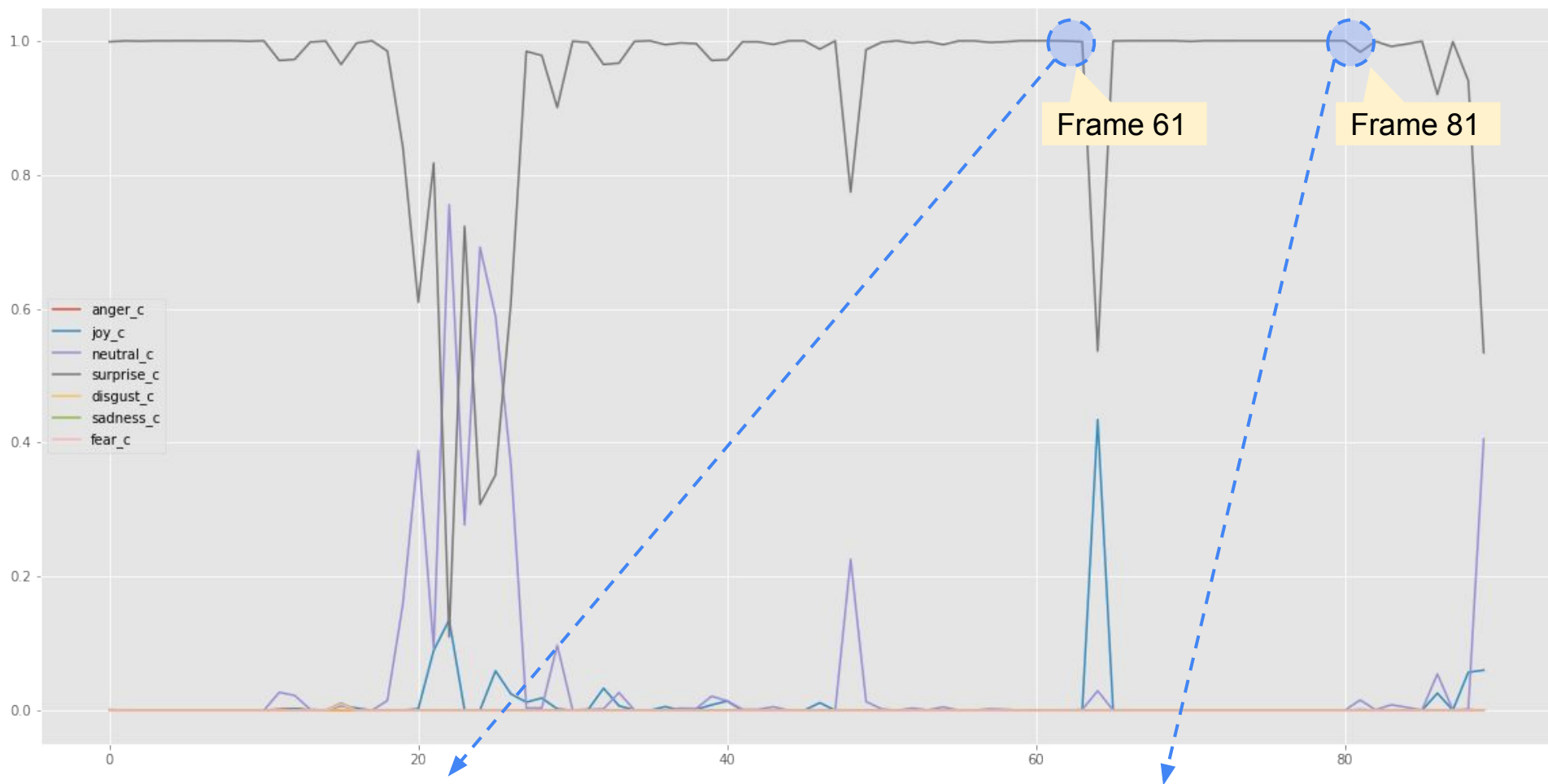
End







# OpenFace+OpenPose 3 Layers NN with Pytorch Epoch 300



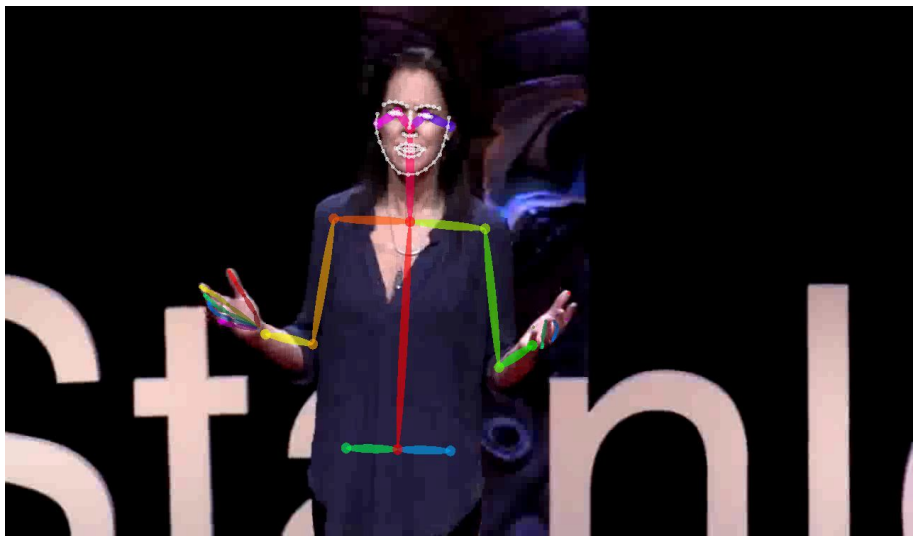
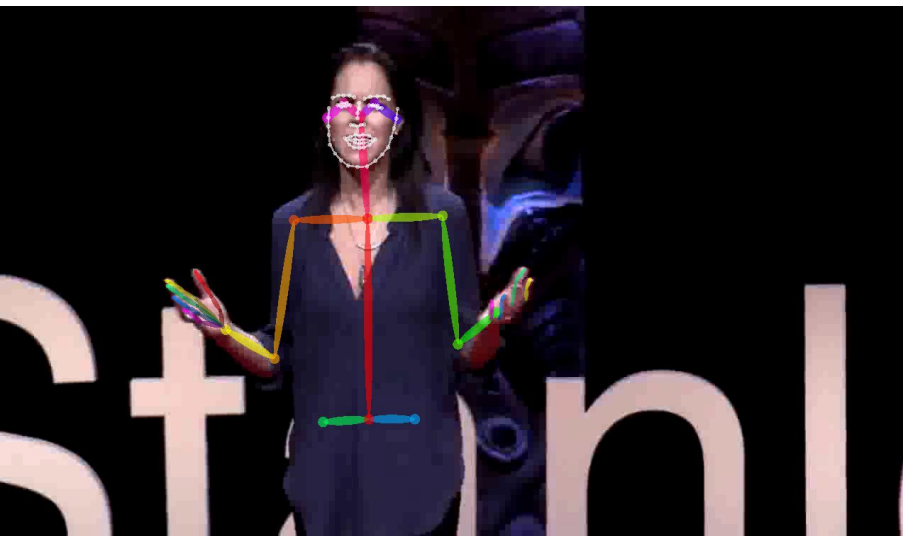
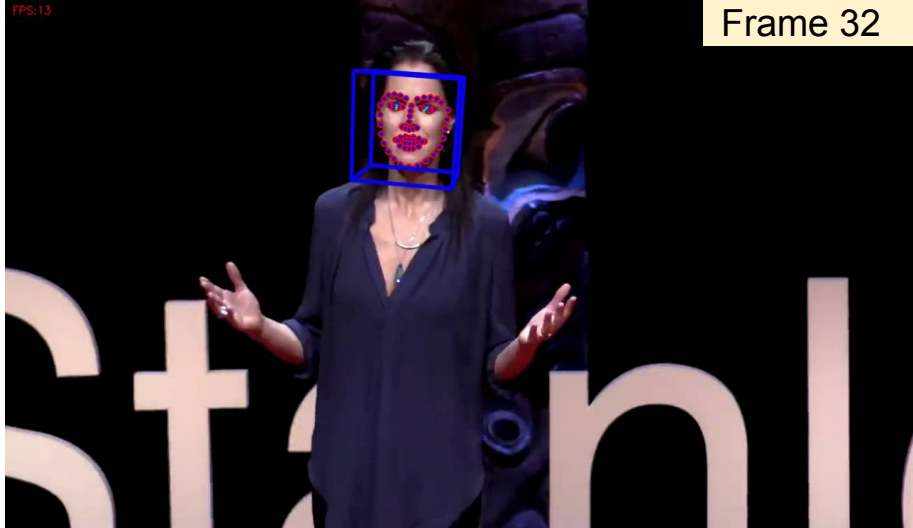
FPS:13

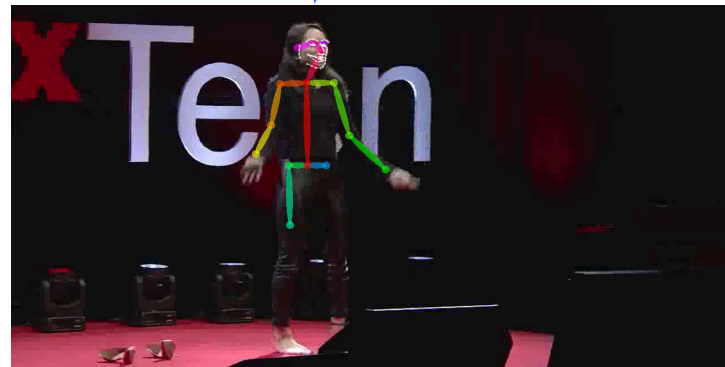
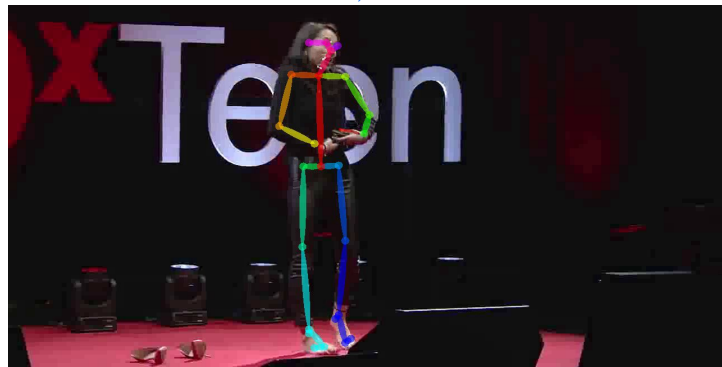
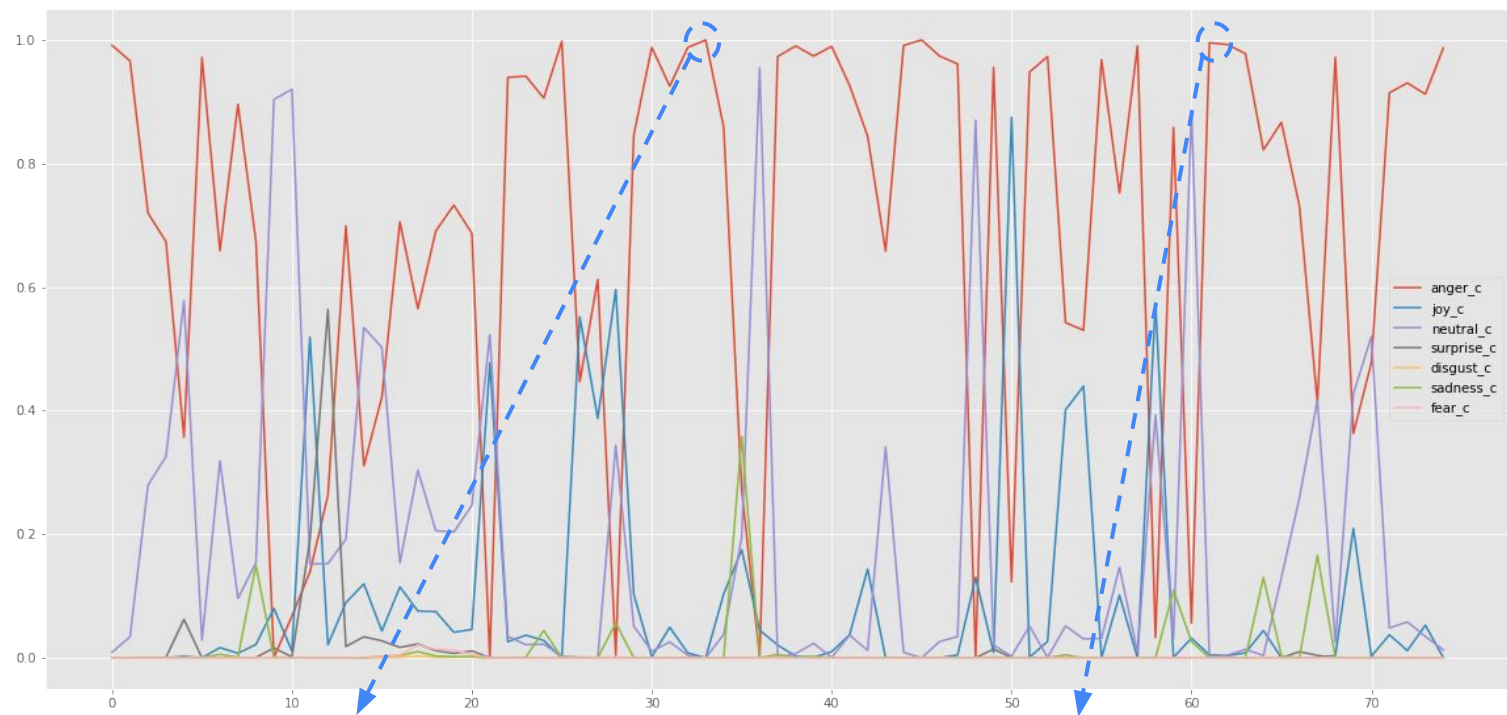
Frame 61



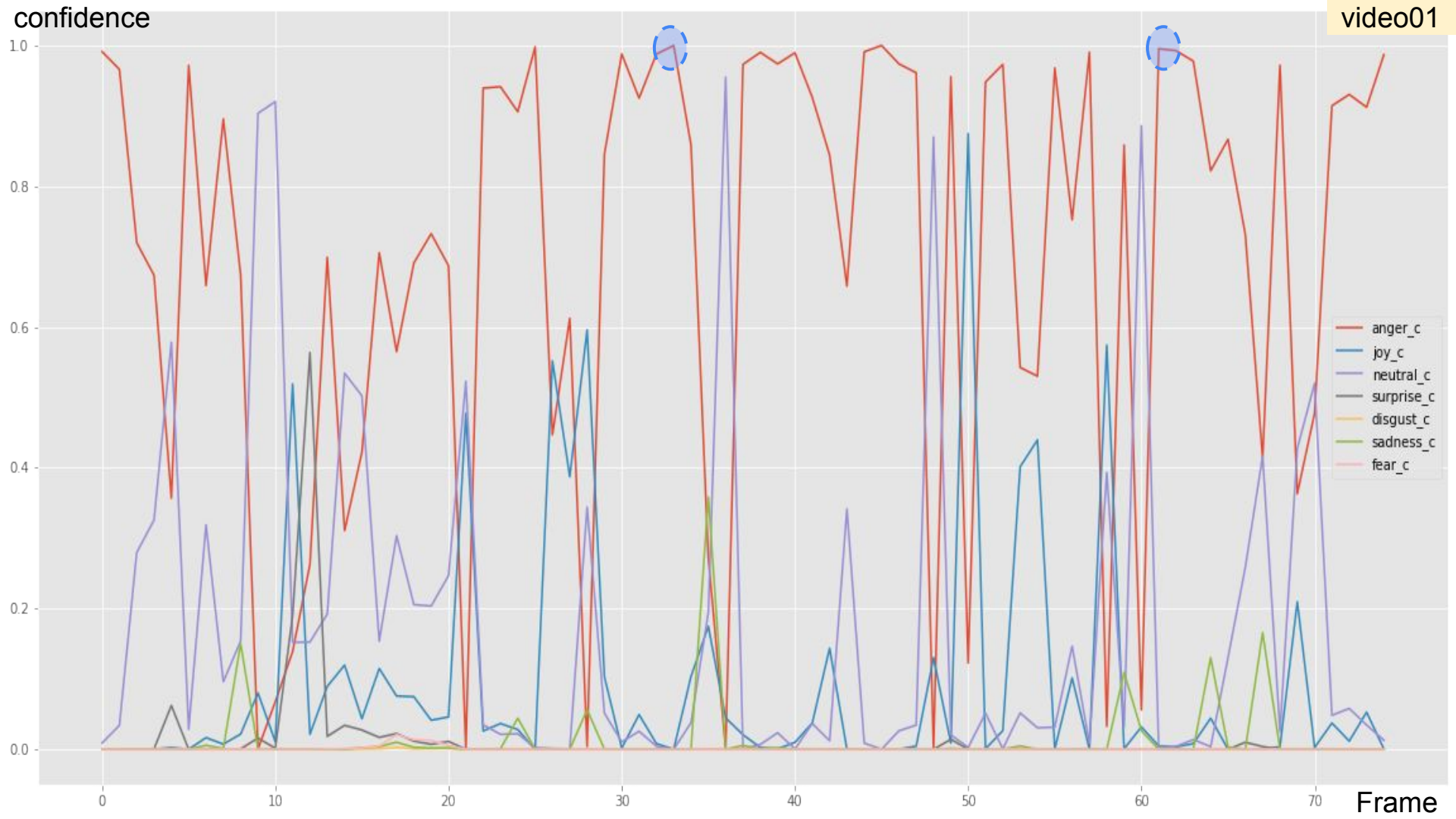
FPS:13

Frame 32



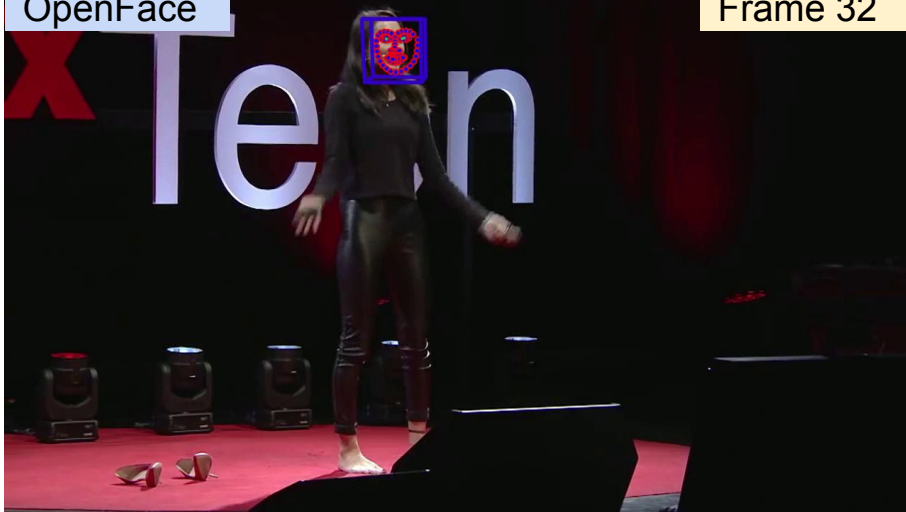




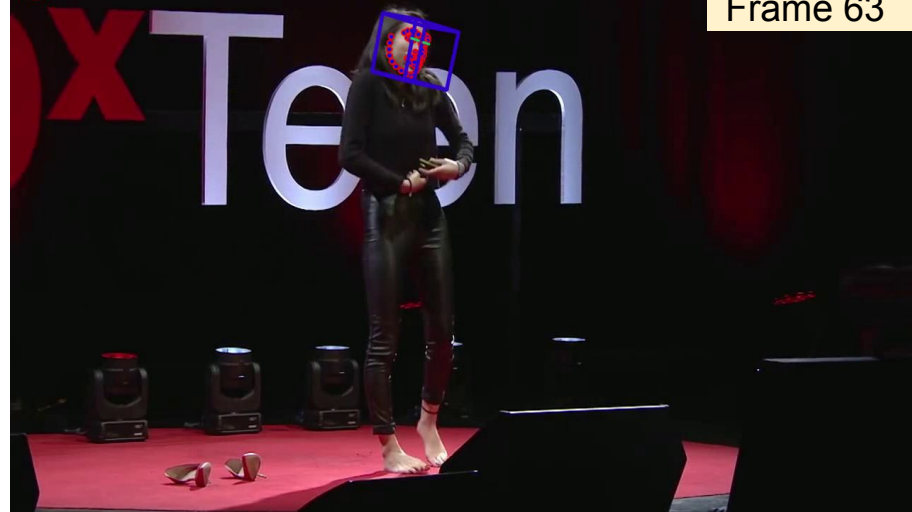


OpenFace

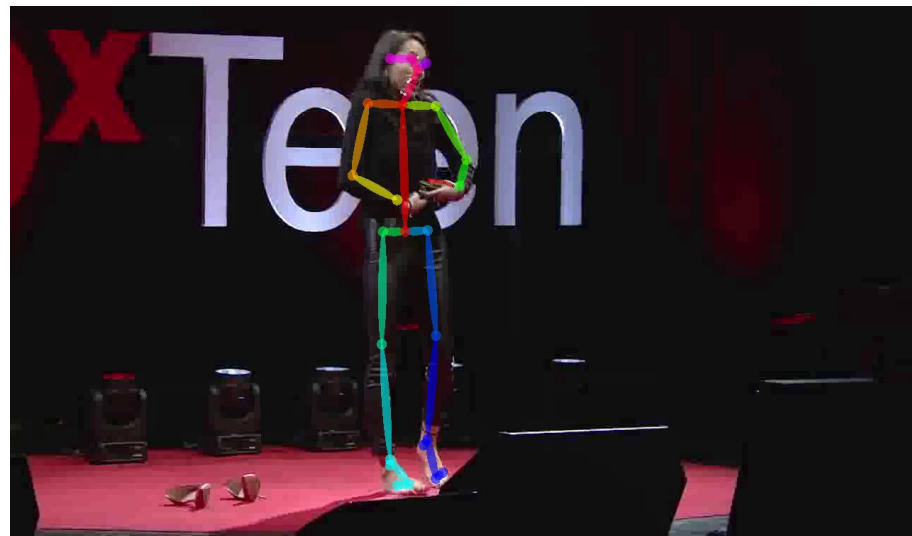
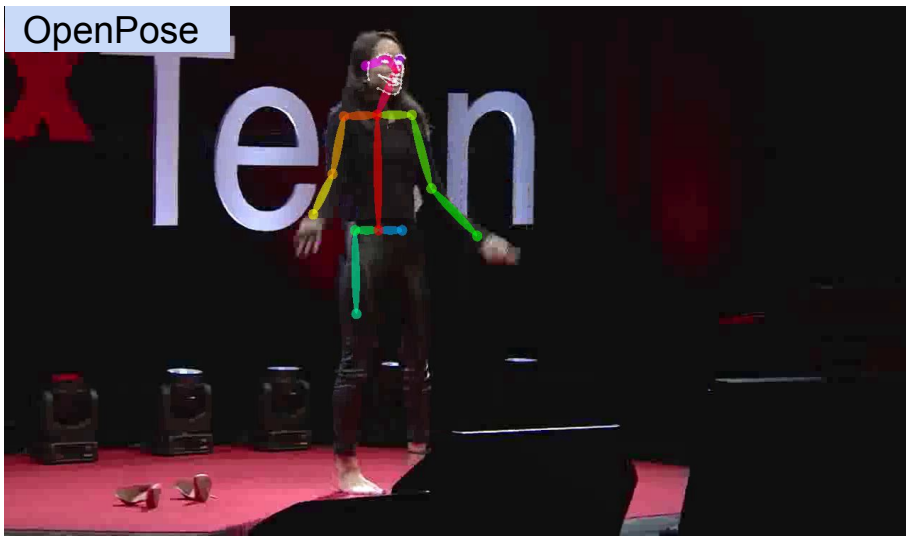
Frame 32

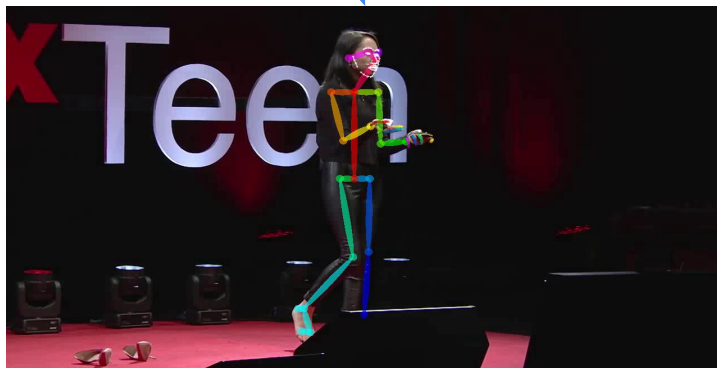
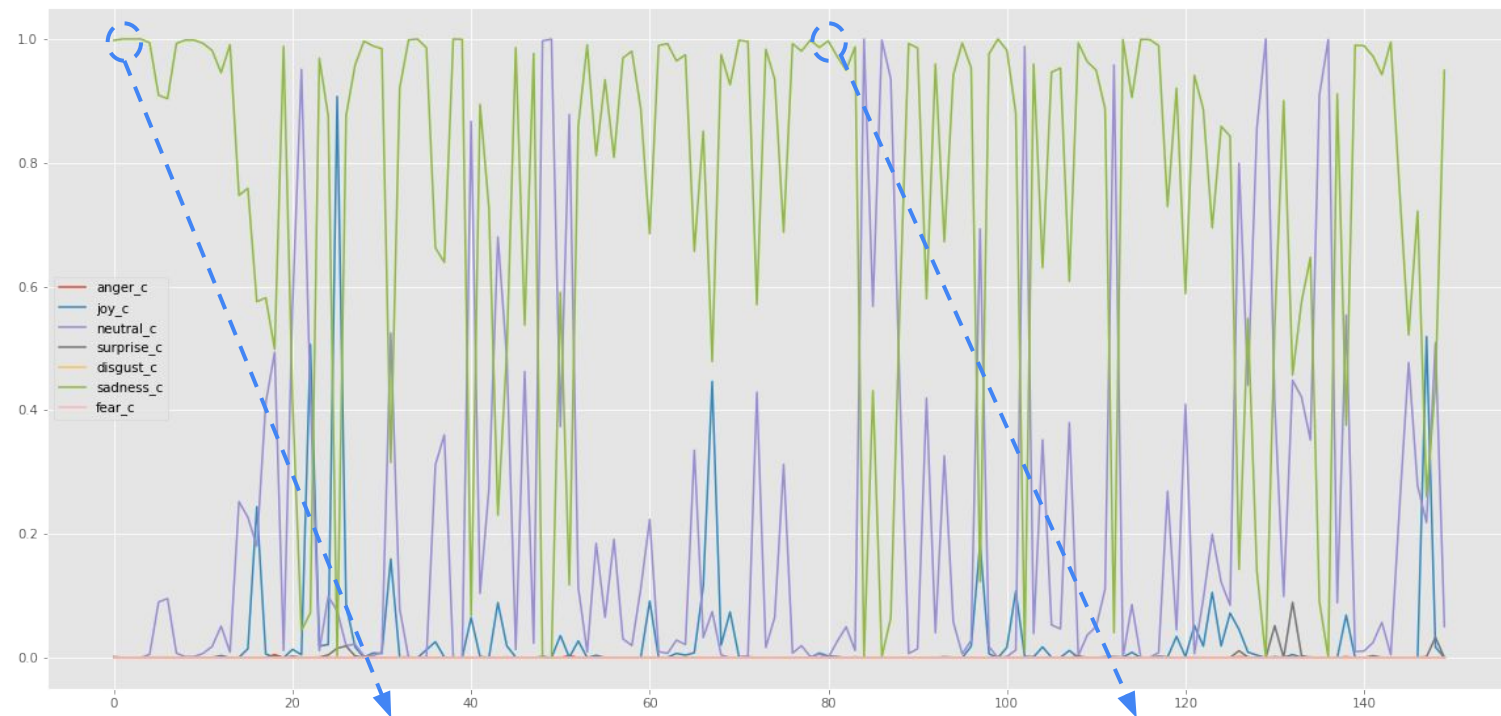


Frame 63

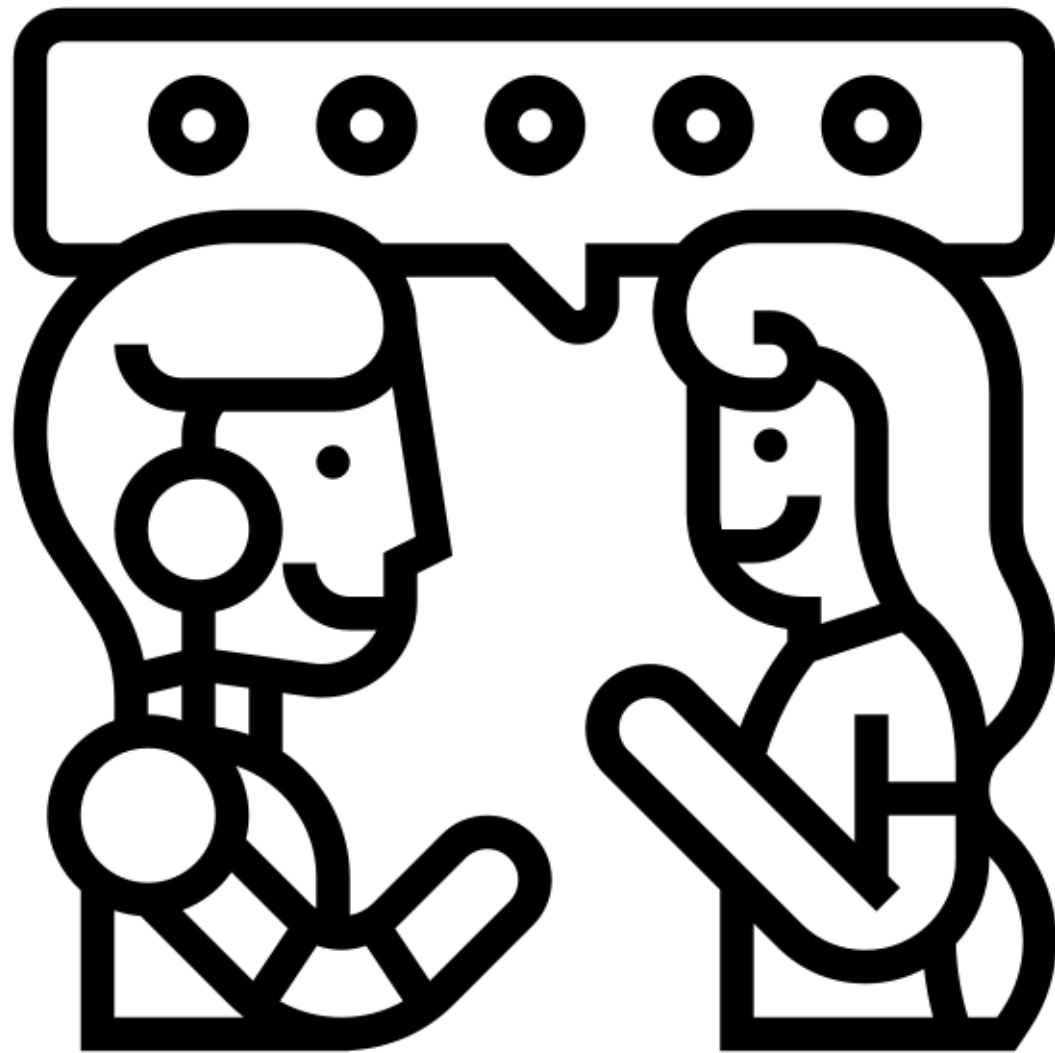


OpenPose









## Data Preparation

1. capture a dataset that contains people talking and the text of what they say.

2. using the conversation text, do sentiment analysis. (A)

3. from the videos, extract facial feature points. (B)

4. from the videos, extract people and body pose. (C)



Positive/  
Negative

Data  
Preprocessing



## Implementation

5. train a model to predict (A) from (B), (C) and (B) + (C)



Positive/  
Negative



Positive/  
Negative



Positive/  
Negative

## Evaluation

6. evaluate and analyse the results.

Evaluation  
Metrics

Accuracy

F-Score

Recall

Precision

