SWS3004 – Team No. 31

ASSESS

Audience facial reSponSE SyStem

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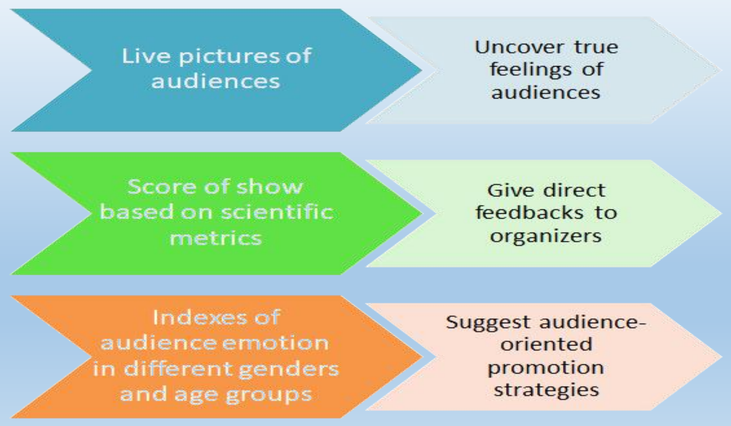
Motivation and Objective

Motivation



Objective

- Judge the quality of performance by recognizing the facial expressions of the audience.
- Analyze the target audience by age and gender recognition.
- Scope of project:
  - Emotion:happy,sad,surprised,neutral
  - Show:comedy,touching lecture,magic show

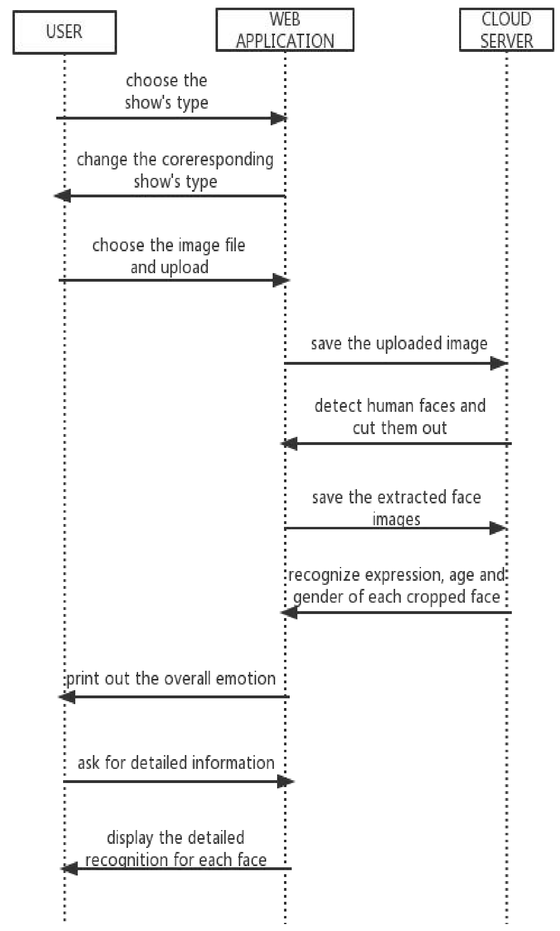
Approach

Workflow of ASSESS

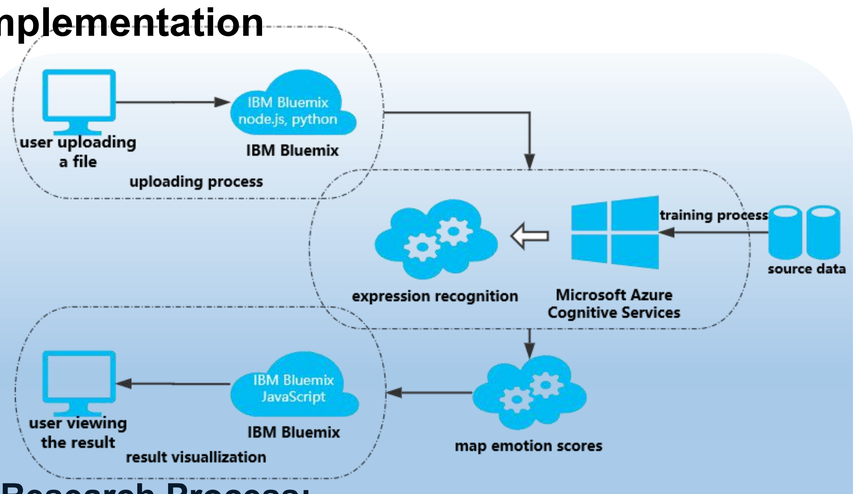
- Input pictures taken every (e.g.)1 minutes during performance
- Cut out faces from an image with multiple faces
- Individual expression recognition
- Mapping emotion scores to final result
- Combine results using our metrics to get a conclusion

Statistical Visualization

- Statistical analysis：
  - Different evaluating metrics for various kinds of performance
  - Reflect overall score of the show
    - indivual emotion percentage,age,gender
- Assess the show&Decide target audiences



Implementation



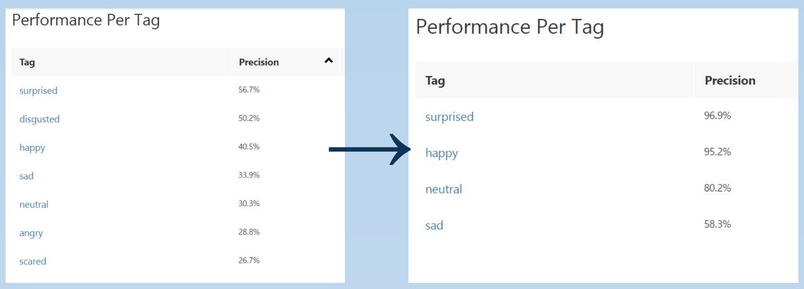
Research Process:

· Find the proper dataset and train the custom model in Microsoft Azure(precision:about 50%)

- Write the python script for locating the coordinates and range of faces and cutting them out of the group photos

node.js python

- Artificially sifting the photo set and retrain the model(precision:about 90%)



Performance Per Tag

Tag	Precision
surprised	56.7%
disgusted	50.2%
happy	40.5%
sad	33.9%
neutral	30.3%
angry	28.8%
scared	26.7%

Performance Per Tag

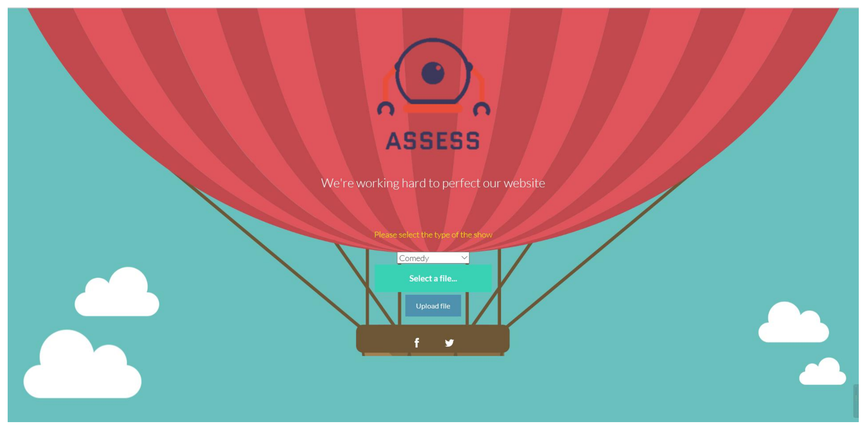
Tag	Precision
surprised	96.9%
happy	95.2%
neutral	80.2%
sad	58.3%

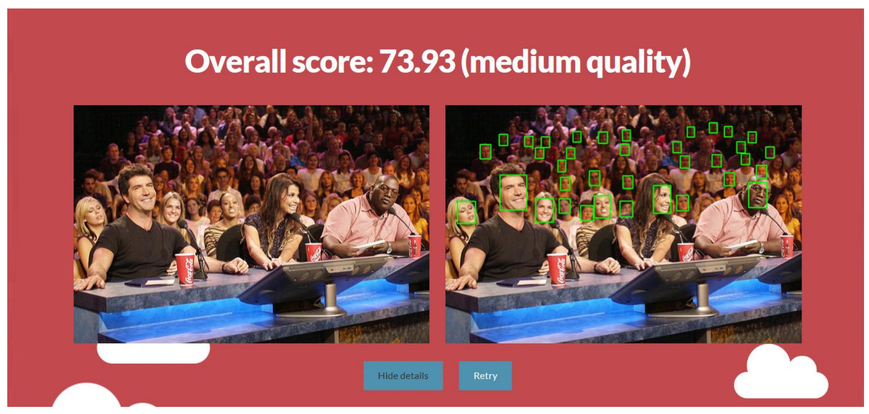
- Calling Watson's API of age and gender recognition
- Calling the model we trained for indivitual emotion
- Define metrics to map the individual scores to the overall result
- Deploy the project on the bluemix

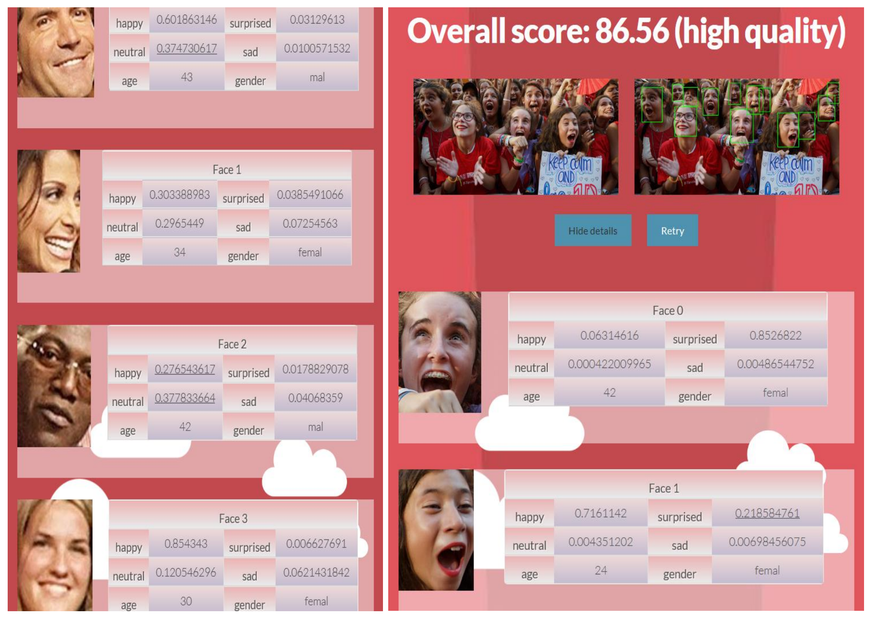
Criteria

Criterion by age and gender				Criterion by show type			
age	factors	gender	factors		comedy	magic show	touching lecture
age ⩽ 20	happy: 0.8	male	surprised: 1.2	happy	1.0	0.4	
	surprised: 0.8		sad: 1.2	surprised	0.2	1.0	
	neutral: 1.2			neutral	-0.2	-0.2	0.2
age > 55	happy: 1.2	female	surprised: 0.8	sad			1.0
	surprised: 1.2		sad: 0.8				
	neutral: 0.8						

Result obtained







Conclusions

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- We are able to achieve the function of calculating overall emotion of audience based on an image of a crowd and analyze emotion distinctions within different genders and age groups.

Lessons

- App development by cloud
- Software prototype designing approaches
- Node.js server implementation
- Teamwork

Limitations

- Cannot upload a series of images of shows
- Expression recognition accuracy

Other use cases

- Assess amusement parks by tourists' feedback
- Assess course quality at school