Target - make video conferencing more fun

Extract Emotions out of Video Stream to optimize Video conferencing

Reduce bandwidth for shorter latency between clients

Introduce AVATARs that mirror people's emotions

Bandwidth Benchmark for Video Conferencing

Art des Anrufs	Mindestgeschwindigkeit Download / Upload	Empfohlene Geschwindigkeit Download / Upload
Anrufe	30 Kbit/s / 30 Kbit/s	100 Kbit/s / 100 Kbit/s
Videoanrufe / Bildschirmübertragung	128 Kbit/s / 128 Kbit/s	300 kbit/s / 300 kbit/s
Videoanrufe (hohe Qualität)	400 kbit/s / 400 kbit/s	500 Kbit/s / 500 Kbit/s
Videoanrufe (HD)	1,2 Mbit/s / 1,2 Mbit/s	1,5 Mbit/s / 1,5 Mbit/s

https://support.skype.com/de/faq/fa1417/wie-viel-bandbreite-benotigt-skype

Skype Bandwidth Details

Art des Anrufs	Mindestgeschwindigkeit Download / Upload	Empfohlene Geschwindigkeit Download / Upload
Anrufe	30 Kbit/s / 30 Kbit/s	100 Kbit/s / 100 Kbit/s
Videoanrufe / Bildschirmübertragung	128 Kbit/s / 128 Kbit/s	300 kbit/s / 300 kbit/s
Videoanrufe (hohe Qualität)	400 kbit/s / 400 kbit/s	500 Kbit/s / 500 Kbit/s
Videoanrufe (HD)	1,2 Mbit/s / 1,2 Mbit/s	1,5 Mbit/s / 1,5 Mbit/s
Gruppenvideo (3 Personen)	512 Kbit/s / 128 Kbit/s	2 Mbit/s / 512 Kbit/s
Gruppenvideo (5 Personen)	2 Mbit/s / 128 Kbit/s	4 Mbit/s / 512 Kbit/s
Gruppenvideo (mehr als 7 Personen)	4 Mbit/s / 128 Kbit/s	8 Mbit/s / 512 Kbit/s

# Android Video Encoding Recommendations

	SD (Low quality)	SD (High quality)	HD 720p (N/A on all devices)
Video resolution	176 x 144 px	480 x 360 px	1280 x 720 px
Video frame rate	12 fps	30 fps	30 fps
Video bitrate	56 Kbps	500 Kbps	2 Mbps
Audio codec	AAC-LC	AAC-LC	AAC-LC
Audio channels	1 (mono)	2 (stereo)	2 (stereo)
Audio bitrate	24 Kbps	128 Kbps	192 Kbps

Facial Expression Analysis

Gain deeper insights into expressed facial emotions

Contact us

https://imotions.com/biosensor/fea-facial-expression-analysis/
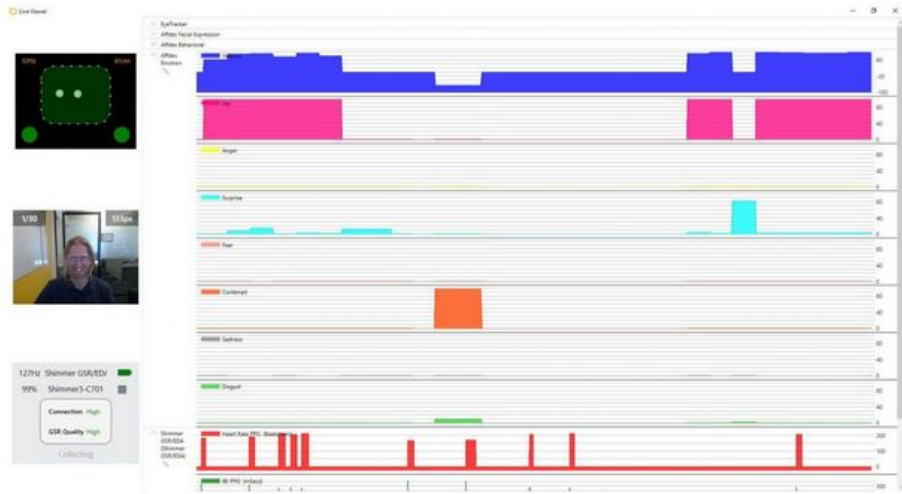
How does the FEA module categorize facial emotions?

The module provides 20 facial expression measures (action units), 7 core emotions (joy, anger, fear, disgust, contempt, sadness, and surprise), facial landmarks, and behavioral indices such as head orientation and attention. These output measures provide probability values to represent the likelihood that the expected emotion is being expressed. Summary scores of engagement and valence are also provided, giving you an overview of the overall expressed response.

https://imotions.com/blog/facial-action-coding-system/

https://imotions.com/blog/facial-action-coding-system/

Main Action Units

Action Unit	Description	Facial Muscle	Example (Hover to Play)
1	Inner Brow Raiser	*Frontalis, pars medialis*	
2	Outer Brow Raiser (unilateral, right side)	*Frontalis, pars lateralis*	
4	Brow Lowerer	*Depressor Glabellae, Depressor Supercilli, Currugator*	
5	Upper Lid Raiser	*Levator palpebrae superioris*	
6	Cheek Raiser	*Orbicularis oculi, pars orbitalis*	

7	Lid Tightener	*Orbicularis oculi, pars palpebralis*	
9 (also shows slight AU4 and AU10)	Nose Wrinkler	*Levator labii superioris alaquae nasi*	
10 (also shows slight AU25)	Upper Lip Raiser	*Levator Labii Superioris, Caput infraorbitalis*	
11	Nasolabial Deepener	*Zygomatic Minor*	
12	Lip Corner Puller	*Zygomatic Major*	
13	Cheek Puffer	*Levator anguli oris (Caninus)*	

...

Facial Expression Datasets

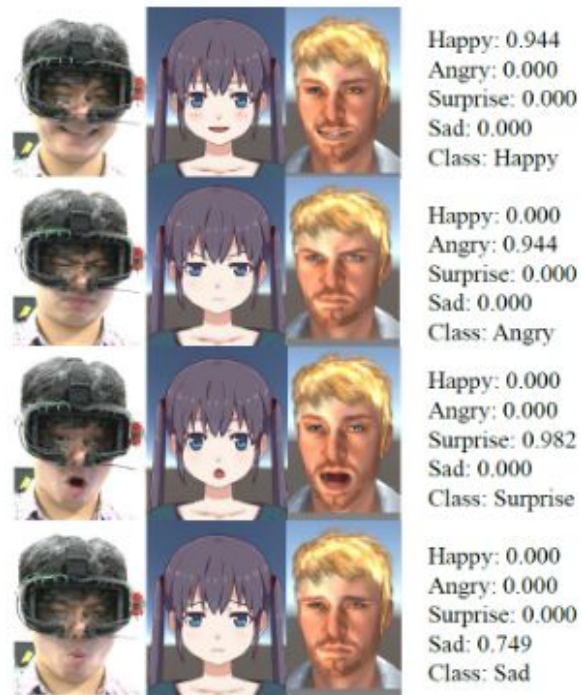https://en.wikipedia.org/wiki/Facial_expression_databases

Facial Expressions into VR Avatar with Sensors

図16 ディスプレイ部分を取り除いた HMD
Fig. 16 Uncovered HMD frame

つきが確認できた. 識別精度の低いユーザの特徴とし
ては, 表情変化が小さいこと, 表情の再現性が低いこ
と, 顔形状の違いからセンサ値のいくつかに変化が見

Happy: 0.944
Angry: 0.000
Surprise: 0.000
Sad: 0.000
Class: Happy

Happy: 0.000
Angry: 0.944
Surprise: 0.000
Sad: 0.000
Class: Angry

Happy: 0.000
Angry: 0.000
Surprise: 0.982
Sad: 0.000
Class: Surprise

Happy: 0.000
Angry: 0.000
Surprise: 0.000
Sad: 0.749
Class: Sad

https://www.semanticscholar.org/paper/Facial-Expression-Recognition-and-Mapping-to-Avatar-Suzuki-Nakamura/3625e8712fb0682e43f7fd1785cbf17e074c4b76

Oculus Rift Hack Transfers Your Facial Expressions onto Your Avatar

Facebook teams with researchers to transfer your smiles and frowns into virtual reality.

The software combines data from sensors tracking the upper and lower parts of the face and matches the result onto a 3-D model of a face.

https://avatarsdk.com/face-capture-sdk/