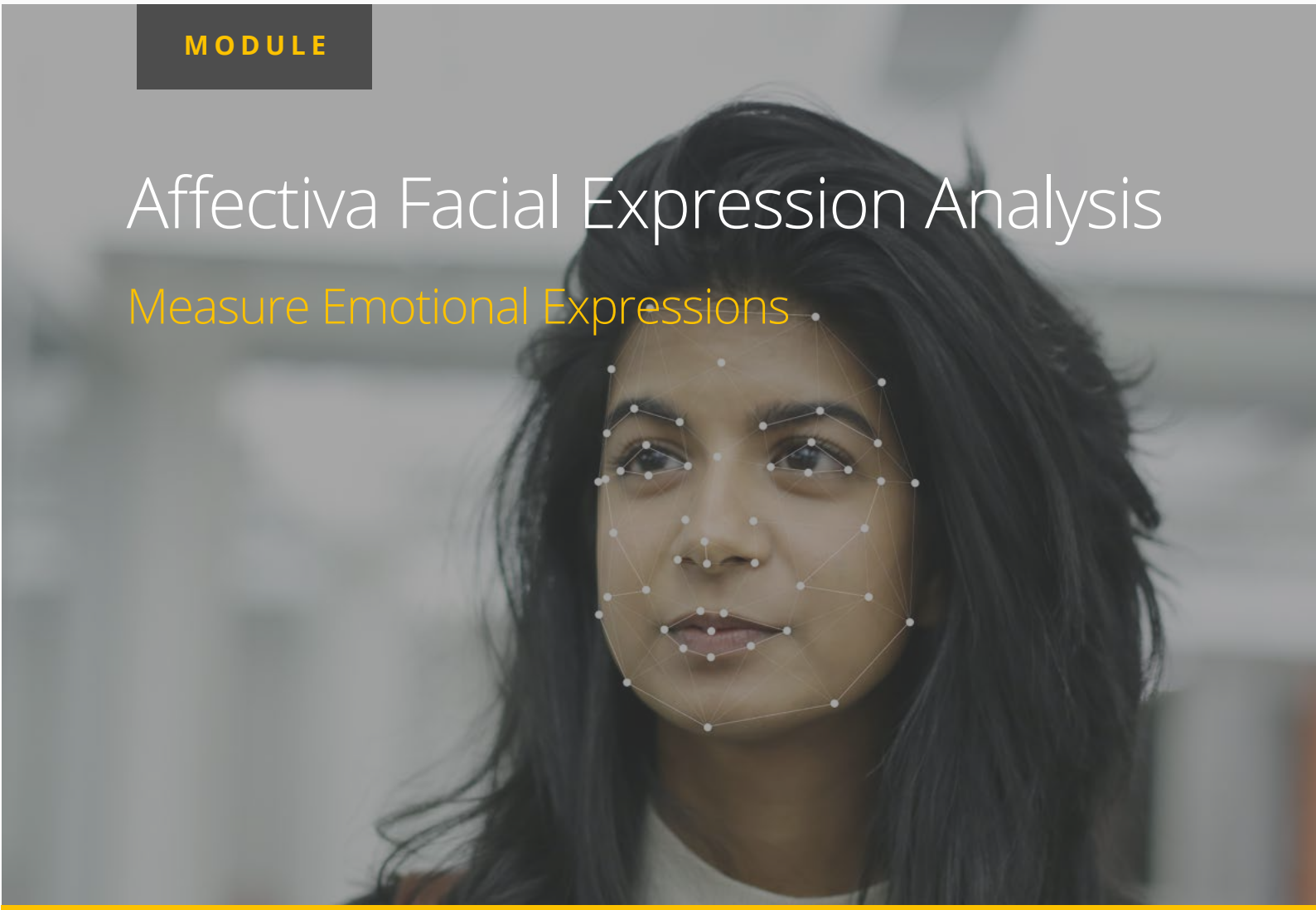
IMOTIONS

MODULE

Affectiva Facial Expression Analysis

Measure Emotional Expressions



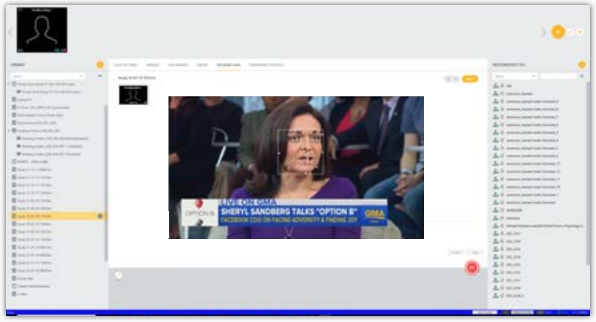
Affectiva Module

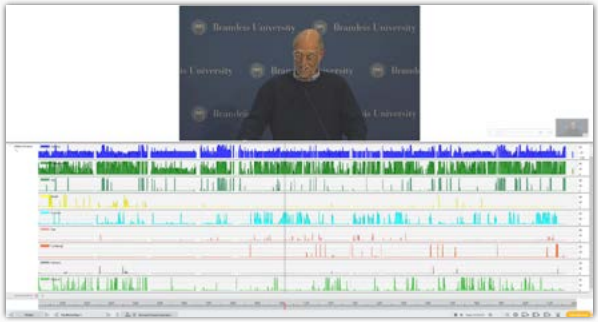
Affectiva Facial Expression Analysis

Categorize and record expressed emotional responses

The Affectiva module enables the utilization of Affectiva's leading facial expression analysis on live webcam feeds or video recordings. Data can be viewed live, then analyzed and exported, helping understand expressed facial responses.

- Single platform for integrating and implementing facial expression analysis into human behavior research
- Categorize facial emotions based on landmarks, expressions, or valence
- Cloud-based processing for rapid analysis of facial emotions





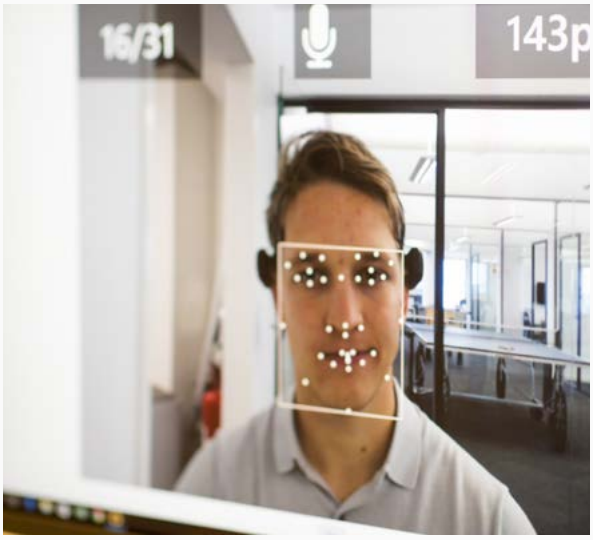
Watch the video below to see how Spencer Gerrol, CEO of Spark Neuro (previously Spark Experience) uses Affectiva's facial expression analysis and iMotions in work and research.

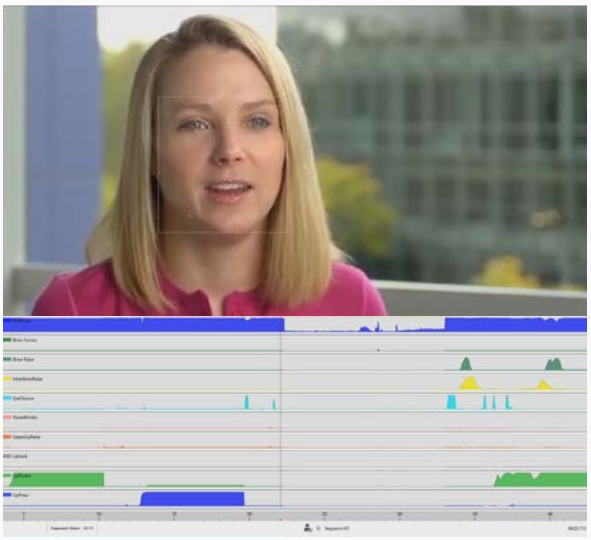
Affectiva Module Features

Quickly and easily assess facial emotions

Understand emotions

Analysing facial expressions allows rapid, quantifiable insights into expressed facial emotions. Facial expression analysis has been carried out manually for decades - now this can be carried out immediately, helping you understand the facial emotions elicited by stimuli as fast as they are generated.





Post-import and analyze

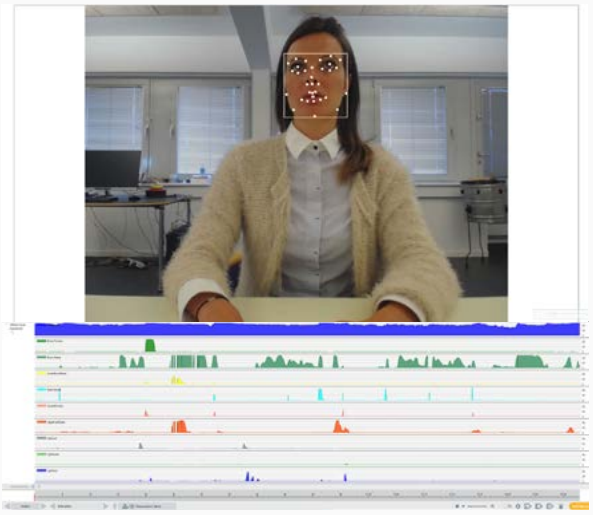
Video recordings can be post-imported into iMotions for facial expressions to be analysed without the need for live analysis. Record however you like, or use prior recordings, to understand expressed emotions.

Seamlessly integrated with other biosensors

Integrate and synchronize 50+ different sensors from 20+ independent vendors, across 10+ modalities. Add even more sensors through the Lab Streaming Layer. Forward data in real time and import external sensor / software data and loop it back into the platform via the API.

Non-intrusive and natural

Facial expression analysis only requires a webcam for recording the face, and can thus be carried out in a wide range of environments. No intrusive measurements are required for recording natural facial expression data.

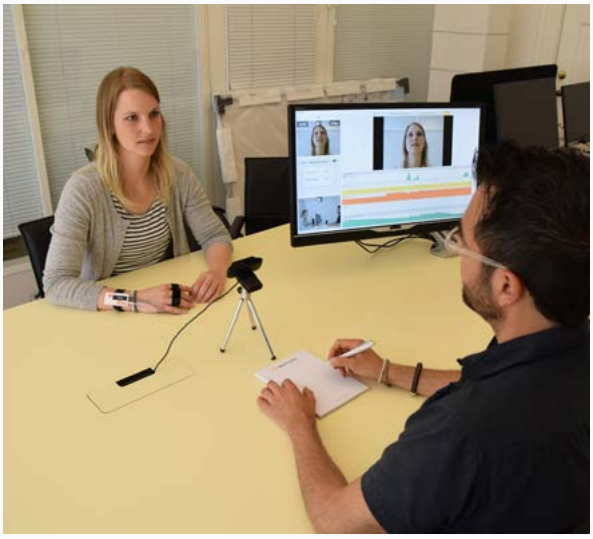


Rapid, unbiased results

Affectiva's facial expression analysis provides unbiased measurements of emotional expressions. Understand emotional expressions in real-time to stimuli and come to conclusions quickly.

Vast range of data

Affectiva provides data at the level of valence and complex facial emotions all the way to individual facial landmarks, that can be either examined within iMotions or exported for further analysis. This means you can be as granular as you need to be in your understanding of participant's facial expressions.



How Affectiva Works

The leading solution for facial expression analysis

iMotions employs the use of Affectiva's algorithms for facial expression analysis. Affectiva has led the way in the introduction of automated facial expression analysis for research, in both the academic and commercial sphere.

:) Affectiva

The science of the face

Affectiva's algorithms are trained using their emotion data repository, that has now grown to over 6 million faces analyzed in 87 countries. They continuously test their algorithms to provide the most reliable and accurate emotion metrics. The data has been gathered representing real-world, spontaneous facial expressions, made under challenging conditions such as changes in lighting and background noise, and variances due to ethnicity, age, and gender.

To solve the task of identifying dynamically changing facial expressions across a range of participants, Affectiva has deployed the use of convolutional and recurrent neural networks. These methods have been designed with feasible computational consumption in mind, ensuring that the analysis can be delivered quickly. iMotions additionally offers cloud-based analysis that can greatly expedite the processing of results from long-duration recordings of faces.

Advanced methods, advanced metrics

Affectiva unobtrusively measures unfiltered and unbiased facial expressions of emotion, using just a standard webcam. Their technology first identifies a human face in real time or in a video. Computer vision algorithms identify key landmarks on the face – for example, the corners of your eyebrows, the tip of your nose, the corners of your mouth. Deep learning algorithms then analyze pixels in those regions to classify facial expressions. Combinations of these facial expressions are then mapped to emotions.

Affectiva measures 20 facial expression metrics, alongside 33 facial landmarks, as well as interocular distance an head orientation. This information gives rise to probability values that show the likelihood of one of the 7 basic emotions being exhibited: anger, contempt, disgust, fear, joy, sadness or surprise. Summary scores of engagement and valence are also provided, giving you an overview of emotion.

Facial Expression Analysis Metrics

Complete data to further understanding

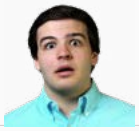
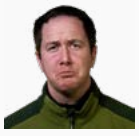
The chart below shows the data that Affectiva is able to collect from facial expressions. Use facial landmarks for fine-grained data, or assess expressed emotions through Affectiva's calculations. Access other data for determining behavior in response to stimuli.

Metric	Number of components	Description
Valence	3	A measure of the positive or negative nature of the recorded person's experience: positive, negative, neutral
Basic emotions	7	Core emotions based on facial expressions: Joy, Anger, Surprise, Fear, Sadness, Disgust, Contempt
Extended emotions	2	Facial expressions related to sentimentality and confusion.
Engagement	1	A measure of facial muscle activation that illustrates the subject's expressiveness.
Action units	20 (+ attention)	Expressions determined by change in facial landmarks: Attention, Brow Furrow, Brow Raise, Inner Brow Raise, Eye Closure, Nose Wrinkle, Upper Lip Raise, Lip Suck, Lip Pucker, Lip Press, Mouth Open, Lip Corner Depressor, Chin Raise, Smirk, Smile
Facial landmarks	4	Geometrical mapping of the face: Outer Left Eye, Outer Right Eye, Nose Tip, Chin Tip
Interocular distance	1	Distance between two outer eye corners for estimation of distance from screen
Head orientation	3	Head rotation: yaw, pitch, roll

Facial Expression Analysis Values

How the metrics are calculated

Affectiva's algorithms compute the likelihood of a facial expression based on the activation of certain facial movements. The chart below shows which facial expressions increase or decrease the likelihood of an emotional expression being detected.

Emotion	Image of emotion	Increases likelihood	Decreases likelihood
Joy		Smile	Brow Raise Brow Furrow
Anger		Brow furrow Lid Tighten Eye Widen Chin Raise Mouth Open Lip Suck	Inner Brow Raise Brow Raise Smile
Disgust		Nose Wrinkle Upper Lip Raise	Lip Suck Smile
Surprise		Inner Brow Raise Brow Raise Eye Widen Jaw Drop	Brow Furrow
Fear		Inner Brow Raise Brow Furrow Eye Widen Lip Stretch	Brow Raise Lip Corner Depressor Jaw Drop Smile
Sadness		Inner Brow Raise Brow Furrow Lip Corner Depressor	Brow Raise Eye Widen Lip Press Mouth Open Lip Suck Smile
Contempt		Brow Furrow Smirk	Smile

Selected Publications

Research made possible with iMotions and Affectiva

Toward Affect-Sensitive Virtual Human Tutors: The Influence of Facial Expressions on Learning and Emotion

Authors: Mudrick, N. V., Taub, M., Azevedo, R., Rowe, J., Lester, J.

University: North Carolina State University

View publication

Objective, computerized video-based rating of blepharospasm severity

Authors: Peterson, D. A., Littlewort, G. C., Bartlett, M. S., Macerollo, A., Perlmutter, J. S., Jinnah, H. A., et al

Institutes: Howard Hughes Medical Institute, Salk Institute, University of California, University College London, WUSTL, Emory University, NIH

View publication

Identifying correlation between facial expression and heart rate and skin conductance with iMotions platform

Authors: Lei, J., Sala, J., Jasra, S.

University: University of Windsor

View publication

Visual Attention Mechanisms in Happiness vs. Trustworthiness Processing of Facial Expressions

Authors: Calvo, M. G., Krumhuber, E. G., Fernández-Martín, A.

Institutes: Universidad de La Laguna, University College London, Universidad Internacional de la Rioja, Instituto Universitario de Neurociencia

View publication

Psychopathic Men: Deficits in General Mental Ability, Not Emotion Perception

Authors: Olderbak, S., Mokros, A., Nitschke, J., Habermeyer, E., Wilhelm, O.

University: Ulm University, University Hospital of Psychiatry Zurich, Ansbach District Hospital

View publication

The Effectiveness of Online Cause-Related Marketing Message Framing on Hotel Brand Evaluation

Authors: Kim, H.

University: University of Surrey

View publication

Emotional Journey for an Emotion Provoking Cycling Exergame

Authors: Müller, L., Bernin, A., Kamenz, A., Ghose, S., von Luck, K., Grecos, C., Wang, Q., Vogt, F.

Universities / institutes: Hamburg University of Applied Sciences, University of the West of Scotland, Central Washington University, Innovations Kontakt Stelle

View publication

Emotion recognition for semi-autonomous vehicles framework

Authors: Izquierdo-Reyes, J., Ramirez-Mendoza, R. A., Bustamante-Bello, M. R., Pons-Rovira, J. L, Gonzalez-Vargas, J. E.

Institutes: Tecnologico de Monterrey, Cajal Institute Spanish National Research Council

View publication

Watch the video below to see how Professor Roger Azevedo from North Carolina State University uses Affectiva's facial expression analysis and iMotions in his research.

NC STATE UNIVERSITY

Want to know more?

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