

Eye movements contain important information as do facial expressions. Learn more about subconscious processes by observing outward expressions such as eye movements and facial expressions. Often eye tracking technology is combined with facial expression analysis techniques to provide insight in user experience, preferences, desire, and appreciation. For example in neuro-marketing, cognitive psychology, and user experience research. Both eye tracking and expression analysis can add substantial power to your research by providing information about attention and emotion. Non-verbal responses can provide new information. This white paper shows you how FaceReader™ works and how eye tracking technology can be used in combination with FaceReader.

COLLECT DATA

With current technology a lot of data can be collected automatically using systems such as eye trackers and software such as FaceReader. Increase accuracy and reliability and save time by integrating systems.

Emotion recognition

FaceReader is robust software that is capable of automatically analyzing facial expressions, providing users with an objective assessment of a person's emotion. A total of 6 basic expressions can be recognized: happy, sad, angry, surprised, scared, and disgusted (Ekman, 1970). Furthermore, FaceReader also automatically classifies mouth open-closed, eyes open-shut, and eyebrows raised-neutral-lowered, and it registers head orientation.



Collect data by placing a camera on top of a computer monitor. This way you can follow the facial expressions during a test in which also an eye tracking video is made. Facial expression data can be viewed real-time

in FaceReader on a control PC, but you can also record videos and analyze them afterwards.

The experimental set-up in a FaceReader experiment is very important. FaceReader achieves the best performance with a high quality (video) image. Both the placement of the camera and the lighting of the subject's face are of great importance in obtaining reliable classification results.

Eye tracking

Eye trackers provide you with data about attention and preference of test participants. Gaze direction reflects attention and blink frequency is associated with mental load. Scan paths indicate how people look at websites and advertisements: which parts of an advertisement, picture, or web page they actually notice, how long they look at various items.

When a participant has previous experience with an application, the scan path of the eyes will have fewer fixations. Modern eye trackers can easily generate this information, which makes them increasingly popular in behavioral studies.



Collect data by installing the eye tracker of your choice. Choose for example a computer-monitor eye tracker that tracks the test participant's gaze on a computer screen. They are contact free, and built into or attached to computer monitors. They all make screen captures with a gaze overlay that are suitable for analysis. Some computer-monitor eye trackers allow you to test participant looking behavior real-time

INTEGRATE DATA

If you want to combine eye tracking and facial expression analysis with other data such as physiological data, or you would like to code behaviors, then The Observer® XT

can take your research to a higher level: it offers flexible integration of logged events with videos, eye tracking data, FaceReader data, and physiological data such as EEG. You can also choose to allow other programs to respond instantaneously to the emotional state of the test participant by using the FaceReader API.

The Observer XT as integration platform

Simply connect the eye tracking equipment to a computer that runs The Observer XT and start your data acquisition. When external equipment is connected to The Observer XT, your data sets will be synchronized. The Observer XT facilitates coding from video. You can play two or more videos simultaneously forward or backward and also both at slow and fast speeds. This allows you to fast-forward to a particular point of interest in the video and carry out very detailed logging.

Application Programming Interface (API)

FaceReader produces log files after analysis which can be accessed real-time by other applications via an Application Programming Interface (API). This means that FaceReader can be used for research into affective computing and the design of adaptive interfaces.

ANALYZE DATA

After collecting and in some cases integrating your data, you can start to investigate your results and the relationship between facial expression and eye tracking data.

Visualize and analyze FaceReader data

FaceReader provides a video analysis and a log file which shows you which expression was shown at what moment. The visualization window in FaceReader provides insight in how your video images were analyzed. For example, the mesh shows the position of 491 key points in the face and the facial texture of the area entangled by these points (the Active Appearance Model). Furthermore, customized charts are accessible in just a few mouse clicks. The analysis results can be used in either The Observer XT for further analysis or a statistical program of your choice.

Joint analysis

The Observer XT is suitable for video analysis, for recording behavioral context, and for joint analysis of eye movements and behavior. For example, analyze a commercial. See exactly where the test participant



was looking when smiling. The Observer XT software provides detailed visualizations which help you explore your results. Customized charts and statistics are accessible in a few mouse clicks.

Export data

For additional calculations and analysis, you export all data together and integrate it into a spreadsheet or statistics program of your choice or to DVD for backup. When using The Observer XT as an integration tool, a wide range of presentation options is offered as well, to facilitate communicating your results to others. You can select important video fragments and create your own video highlights clip to illustrate your outcomes.

Feel free to contact us or one of our local representatives for more references, client lists, or more detailed information about FaceReader, Tobii eye trackers, or SMI eye tracking systems.

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