

A method for obtaining 3-dimensional facial expressions and its standardization for use in neurocognitive studies.

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A method for obtaining 3-dimensional facial expressions and its standardization for use in neurocognitive studies

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Abstract

Facial expressions of emotion are increasingly being used in neuroscience as probes for functional imaging and as stimuli for studying hemispheric specialization for face and emotion processing. Available facial stimuli are 2-dimensional and therefore, their orientation is fixed and poorly suited for examining asymmetries, they are often obtained under poorly specified conditions, usually posed, lack ethnic diversity, and are of restricted age range. We describe a method for accurately acquiring and reconstructing the geometry of the human face and for display of this reconstruction in a 3-dimensional format. We applied the method in a sample of 70 actors and 69 actresses expressing happiness, sadness, anger, fear and disgust, as well as neutral expressions. Each emotion was expressed under three levels of intensity and under both posed and evoked conditions. Resulting images are of high technical quality and are accurately identified by

raters. The stimuli can be downloaded in digital form as "movies"™ where angle and orientation can be manipulated for inclusion in functional imaging probes or in tests that can be administered as measures of individual differences in facial emotion processing. The database of emotional expressions can also be used as a standard for comparison with clinical populations.



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Keywords

Emotion; 3-Dimensional faces; Polynocular stereo; Surface reconstruction; Computer vision

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