

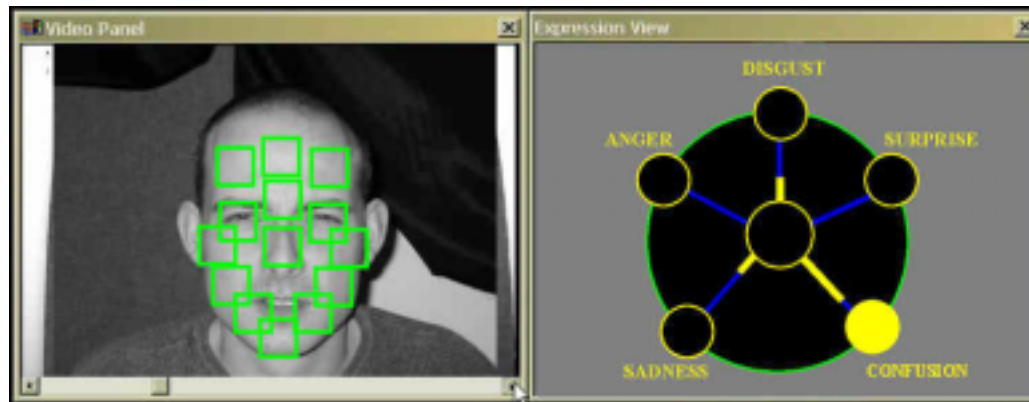


E-Motions: Facial Expression Analysis



PROBLEM ADDRESSED Facial expressions provide an important means of non-verbal communication for humans. People are quite adept at reading facial expressions but may be expensive and/or inefficient to employ in some situations. Machines that can be trained to analyze, interpret, advise and act on human facial expressions could prove useful in such situations.

TECHNICAL ELEMENTS IMSC is pursuing facial expression analysis using a combination of methods. The first is a holistic approach that looks at the full face to classify expressions. This method begins with a “training phase,” in which a subject poses for a series of images that record a particular emotion. The holistic method is useful for analyzing high-level expressions such as HAPPY, SAD, ANGRY, etc. The second method is more refined and permits analysis of localized areas of the face based on actuation of facial muscles and groups of muscles. The third is a sparse feature point analysis that can contribute to system robustness.



POTENTIAL MARKET creation of speech sequences and 2- or 3-dimensional facial animation sequences for entertainment applications; development of 3-D avatars for advanced, virtual 3-D immersive environments; incorporation into automated teller machines and un-staffed consumer information kiosks to improve customer service; as a clinical aid, helping physicians and psychologists evaluate and diagnose patients

BENEFITS (1) Holistic, full-face analytical approach is effective in analyzing high-level emotions (2) local analysis technique enables refinement of classification by correlating facial muscle contraction with local skin motion on the face (3) muscle-based classification technique extends analysis to expressions for which the system has not been trained (4) method can define new expressions that may be difficult for a subject to perform spontaneously (5) may be used to classify non-emotional responses such as confusion or frustration

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