

## JANUS PROGRAM: COMMENT

DAVID SARMA

### 1. FACIAL REPRESENTATIONS

A core problem in the interpretation of faces is the lack of robustness of current methods. Fragility of this type suggests the likelihood that the current base notion of a face, the representation in use in computer vision systems, is at a higher level than is appropriate for the desired level of performance. In particular, it is at a higher level than that in use by the human perceptual system. While the current base notion is constructed on the relative spatial positioning of structural elements of the face, it is possible in generative work in an art setting to provide extreme decompositions and reconstitutions of elements, removing many traditional notions of ordering, while still suggesting the existence of faces. Examples are given below. This suggests that the true base notion of a face is constructed from lower level textural cues, and as such is far more robust than any representation constructed at base level from spatial ordering. A representation constructed from this principle would likely address problems such as those posed by partial or degraded data, and occlusion.

It is recommended that a rebasing of the primitive notions of faces be considered, motivated by the human perceptual system, and guided by experimentation in a generative sense.

### 2. IDENTITY

A persistent notion of identity over perception exists from the perspective of individuals. In the domain of retouching for motion pictures is specifically addressed the set of low level operations which act to uncover the notion of identity which exists to an individual. Addressed are physical properties of the person as expressed in skin texture, and shape properties captured in geometry. Addressed also

are properties of the environment: artifacts of lighting conditions, capture technology, and image composition. Combined, the operations performed act to generate a notion of identity which is ideal from the perspective of the individual. In this sense, the output of a set of retouching operations is a representation of an individual in which a core notion of identity is brought forth and preserved over the domain of the project specification.

Two areas of development are suggested: 1) Improved methods for generating an idealized, canonical form of an individual to use as input to current systems may yield immediate improvements. 2) Observation of the operations performed to construct a notion of identity may suggest the low-level invariants from which may be constructed more robust descriptors.

### 3. CONCLUSION

Generative, art-level work allows for and encourages a type of aggressive experimentation which acts on perception in full dimensionality to uncover characteristics of a space. The advantage is in broad coverage of possible strategies in initial stages, and continuous verification built in to working methods. Generating wider classes of hypotheses may help to counter some of the conservatism and biases introduced in certain approaches which favor linguistic condensations at an earlier stage. As well, demanding a level of density in results such that they may be subject to the scrutiny of perception provides an alternate means of judging correctness that filters out biases in a natural way. Pairing this approach with traditional research methodology may yield improved outcomes. Combined with appropriate notions of existence, uniqueness and similarity, there may be greater possibility of constructing correct solutions which allow true insight and predictive ability. It is recommended that future projects account for the advantages offered by this approach.

DAVID SARMA

