Annotated Bibliography

Anderson, J.A.D.W. "Visual Conviction", Proc. fifth Alvey Vision Conference, Reading, September 1989, pp. 301-303.

This paper offers the definition that visual knowledge is knowledge which can be put in a two-way spatial mapping with an image. Whilst not clear, this is to be understood as admitting a many-to-many directed mapping. Such as occurs, for example, when a given set of pixels is mapped onto all of the concepts *green*, *leaf*, *flower*, and *garden* and each of these concepts is mapped onto some, all, or more than the pixels in the set. Thus a being that has visual knowledge can know *what* is in an image and *where* it is.

Whilst it is not clear on the point, the paper is to be understood to suggest that an observer that knows itself to be everywhere fallible cannot know that it has knowledge, in the strict sense of knowledge as indefeasibly justified true belief, but can, at best, believe that it has consistently justified beliefs.

There is one malapropism and two typographical errors. On page 301, column 1: "vindication" should be "verification". On page 303, column 1: superscript "3" should be superscript "5", and superscript "dp" should be deleted.

Anderson, J.A.D.W. "Representing geometrical knowledge", Phil. Trans. Roy. Soc. Lond., series B., vol. 352, no. 1358, 29 August 1997, pp. 1129- 1139.

This is the best available summary of the author's views on computer vision, prior to the unification of projective geometry with Turing computation - which it anticipates. The paper is highly idiosyncratic, but introduces a number of concepts. Firstly, the concept of the *point at nullity* is introduced and, though a little unclear, the discussion anticipates the current interpretation of nullity as being the only point which lies outside conventional projective space. Thus, in current terms, nullity is the single point at which skew lines or non-distinct lines meet, which is to say that there is no *single* point at which they meet in conventional projective space. Secondly, tangents are introduced as a parameterisation of rotation, anticipating the development of transrational arithmetic and a rational implementation of the Jacobi method for recovering eigensystems. However, further work is required on the parameterisation of the perspective transformations. Thirdly, a particular generalised inverse is introduced, but the encoding of this inverse within perspexes by the use of *j*-numbers is now redundant, as is homogeneous division by the absolute value of a *w*-co-ordinate. The encoding of these particular computations is redundant because the current algebraic perspex can perform any computation that a Turing machine can, so it can compute generalised inverses, clippings and projections, or anything else, as required. Fourthly, the related concepts of using total parameterisations to encode a family of shapes and to use an error function to reduce the degrees of freedom sufficiently to obtain a solution are introduced. Such methods support both continuous and categorical perception. Fifthly, the definition of visual consciousness is given, drawing on an earlier definition of what it is that distinguishes visual knowledge from other kinds of knowledge. Sixthly the physical content of some computer feelings is identified, such as the speed of access of memory. Seventhly, the discussion anticipates the unification of symbolic computation and neural computing, but does not anticipate that such a unification can be geometrical, as is now known. Eighthly, the term "perspex" is introduced, though the current algebraic perspex is quite different from the algebraic perspex given in the paper.

There are a number of typographical errors. On page 1132, first column: "J_j" should be "J_5", and "$J_a \rightarrow \langle 0, 0, 0 \rangle$" should be "$J_0 \rightarrow \langle 0, 0, 0 \rangle$". On page 1133, second column: the first occurrence of "at $\lambda = 0$" should be deleted.