



## **PWSOI-22**

### **HOW CAN WE MEASURE TOTAL VISUAL APPEARANCE?**

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One of the biggest challenges in visual appearance research is to measure the “total appearance” of a visual object or scene (CIE 175:2006). Whereas we have well-developed tools and techniques for measuring colour, gloss and, to a certain extent, translucency and texture, these properties of objects or scenes are only the initial stages of a chain of analysis which culminates in a decision such as “will a consumer buy this product?” The industries that seem to have received the most attention in this respect are the food, cosmetics and motor industries (Hutchings, 1999; 2003; CIE 175:2006), but total visual appearance has a critical impact in many other fields. One of the most obvious areas is in medicine. In public health dentistry, for example, it is well known that small doses of fluoride can increase the durability of tooth enamel and therefore improve general dental health. However, a side effect of this can be dental fluorosis, which is a white mottling on the teeth. The critical decision here is whether this mottling on the teeth is severe enough to be a concern (Edwards et al, 2005). Another example from medicine is the visual appearance of scarring following surgery. Is this scarring severe enough to warrant further surgery? What is an acceptable level of scarring? (Simmons et al, 2007). Recently I have been attempting to measure objectively the severity of scarring in images of the faces of school children following surgery for cleft lip or cleft lip and palate. This has proven to be a significant challenge, because, in visual terms, scarring is characterised by more than just the colour difference between scar and non-scar tissue, but also differences in texture, three-dimensional shape and gloss. Another factor is that scarring is often characterised by the absence of continuity in skin colour or texture rather than the presence of a definable scar region. The ultimate goal is to compare these objective measurements of scarring with the subjective ratings of experts (i.e. surgeons) and novices (general public) as well as with the subjective ratings of the scar bearers. In both of these cases - fluorosis and facial scarring - we have the potential for objective measurements of appearance, like colour and texture, which can be calibrated against the rating scales and qualitative descriptions of expert viewers. This, then, seems to be a way forward in visual appearance research: mapping the qualitative and quantitative vocabulary spaces of experts to derive useful measures. Other fields where this may be possible are in zoology (e.g. wild birds’ eggs), archaeology (e.g. ceramic glazes) and geology (e.g. gem-stones). Indeed, any field in which an expert vocabulary exists which quantifies visual appearance dimensions is open to characterisation. This process in turn could engage linguists and semanticists to chart historical and geographical usage differences of these terms, as they have done for colour terms (Biggam & Kay, 2006) and lead to a truly inter-disciplinary field of visual appearance studies. A final step is to map this expert vocabulary onto the value and aesthetic judgements of “regular” human observers (e.g. Simmons & Russell, 2008). In this presentation I shall outline my manifesto for how visual appearance research could proceed, along these lines, with examples from my own research and others involved with Technical Committee TC 1-72 (MApNet).

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