IMAGE
ZEITSCHRIFT FÜR INTERDISZIPLINÄRE BILDWISSENSCHAFT

Call for Papers

Computational Visualistics and Picture Morphology

Thematic issue of IMAGE - Journal on Interdisciplinary Image Science, 2007

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Pictures have to be formalized digitally in an adequate manner when computer scientists are to work with them. It is mainly the relevant physical properties of the corresponding picture vehicle that have to be considered in that formalization: that is, the picture syntax. (If the picture is originally produced with the computer, we here deal with the relevant physical attributes of the potential picture vehicles).

Syntactical considerations belong to the repertoire of visualistics since Nelson Goodman's publications at the latest. Being rather fertile in linguistic syntax studies, the idea of compositional syntax has often been proposed for pictorial syntax, as well – though, with little success: compositional syntax is mainly interested in the syntactically correct composition of words into sentences. A pictorial analogy of words so that pictures could be conceived of as corresponding sentences has not been suggested in a convincing manner.

However, another important building block of syntax studies – at least in linguistics – is given by morphology. Here, the rules of forming words, and hence the inner structure of words, is examined. Words are partitioned in segments that contribute to the word's meaning called 'morphemes'. Morphemes do not have to be words by themselves (e.g., prefixes). Even the semantic function of one morpheme may change in different compositions (e.g., flexion postfix and plural postfix in English). As the syntactical segmentations of pictures follow similar rules, it is prudent to look for picture morphology. A special issue of IMAGE on that theme, focussed by the specific, formalizing perspective of computational visualistics, is planned for 2007.

As the most simple option for morphological parts of pictures, computer science proposes the pixel – the 'picture element' rather well known even to lay persons from popular descriptions of computer graphics. Unfortunately, that proposal remains unsatisfactory for picture morphology: if pixels are applied correctly (i.e., in a sufficiently high resolution) they remain invisible – imperceptible as morphological entities. If they are perceivable we deal as a rule with a bad (and actually not useful) digital record of the morphological structure of a picture.

In image science, coarser structures, like patches, lines, etc., meet the eye as pictorial morphemes – or 'pixemes, for short: Those are the (visible) geometrical Gestalts of the two-dimensional space. Therefore, they are at the focus of the present call for papers. What alternative formalizations for pixemes apart from pixels can be offered by computational visualistics? Where and in which form do such formal pixeme systems play an important role? And

what is the influence these formalizations in computational visualistics have on picture morphology in general?

The thematic issue is also intended as the attempt to offer a clear and easily understandable summary of the state of the art of research on picture morphology in computational visualistics for picture scientists of the other disciplines.

Papers in German, English or French on themes around the following 'crystallization cores' are welcome:

- **Picture morphology as Grammar: L-Systems and Similar Formalizations**

  Certain kinds of formal grammars can be easily interpreted geometrically. Therefore, they may be well used as description languages in picture morphology.

- **Mereo-Geometrical Approaches to Picture Morphology**

  Mereo-geometry is an alternative to Euclidean geometry not based on the highly abstracted concept of an un-extended point but on pixeme-like Gestalts.

- **Pixemes in Non-Photorealistic Computer Graphics**

  While pixemes have seldom been considered in photo-realistic computer graphics, alternative approaches use for example 'hairy brush stroke' pixemes.

- **Image Processing: Pixeme-based Approaches of picture manipulation and Computer Vision**

  Calculating the geometrical structure of a picture as pixemes is an obvious task in computer vision. The algorithmic manipulation of pictures uses more than pixels, as well.

- **Glyphs and Icons: Pixemes in Information Visualization**

  When visualizing complex non-spatial or non-visual circumstances, a special class of pixemes including icons plays an important role.

Submitted papers should not exceed about 50 000 characters. They may rather be richly illustrated. Peer reviewing follows the system established for IMAGE. Before the final publishing, the authors will have the opportunity to access per Internet the other contributions to the special issue, to comment on them, and to co-ordinate their papers with the others.
Please submit – preferably in electronic form, e.g., as a PDF file – your paper till

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to the editorial board of IMAGE or the editor of the special issue Jörg Schirra:

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