LEONARDO THINKS

Opinion: Aesthetic Computing Manifesto

The application of computing to aesthetics and the formation of art and design has a long history. With the integration of hardware, software and cybernetics in the 1960s, computer art emerged as a new art form. We propose to look at the complementary area of *applying aesthetics to computing* [1]. Computing and its mathematical foundations have their own pre-existing aesthetics; however, there is currently a relative lack of variety of these aesthetics, in contrast with art, which has a long history containing a multitude of historical genres and movements. We wish to strike a balance between cognitive and material aesthetics. Software as written in text or drawn with flow-charts may be considered elegant, but that is not to say that the software could not be rephrased or re-presented given the more advanced media technologies that are available to us today. Such re-presentation need not compromise the goal of abstraction, which is a necessary but not sufficient condition for mathematics and computing, as meaning, comprehension and motivation may be enhanced if the presentation is guided by a pluralism of aesthetic choices and multiple sensory modalities.

Computer programs and mathematical structures have traditionally been presented in conventional text-based notation even though, recently, substantial progress has been made in areas such as software and information visualization to enable formal structures to be comprehended and experienced by larger and more diverse populations. And yet, even in these visualization approaches, there is a tendency toward the mass-media approach of standardized design, rather than a move toward a more cultural, personal and customized set of aesthetics. The benefits of these latter qualities are: (1) an emphasis on creativity and innovative exploration of media for software and mathematical structures, (2) leveraging personalization and customization of computing structures at the group and individual levels and (3) enlarging the set of people who can use and understand computing. The computing professional gains flexibility in aesthetics as well as associated psychological attributes such as improved mnemonics, comprehension and motivation. The artist gains the benefits associated with thinking of software, and its underlying mathematical structures, as subject material for making art. With
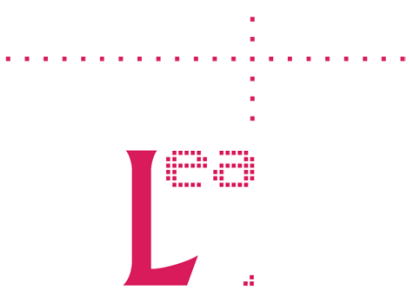
these benefits in mind, we have created a new term, *Aesthetic Computing*, which we define as the application of art theory and, practice to computing.

Endnotes

[1] The Dagstuhl Aesthetic Computing Workshop took place at Dagstuhl, 15-19 July 2001, Wadern, Germany. For the Dagstuhl Seminar and Proceedings, see <http://www.dagstuhl.de/02291/>." For further readings, see the Leonardo Aesthetic Computing bibliography <http://www.csse.monash.edu.au/~jonmc/resources/AestheticComputing/bibliography.html>.

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