# New Media, New Craft?

AUTHOR

**Andrew Richardson**
University of Sunderland
Sunderland, United Kingdom
andrew.richardson@sunderland.ac.uk

This paper will examine the use of computer programming in relationship to the practice and approach of traditional crafts, paying specific attention to the ethos of the Arts and Crafts Movement as a model for assessing the use and status of computation in a creative context. In order to consider the role of programming in the context of traditional craft, it is important to provide a brief outline relating to the ethos and practice of craft. What is understood by the term *craft*, what are its characteristics and outcomes? After considering this, it will then be possible to apply this understanding to the role of programming and its engagement with digital material.

## Understanding Craft

At the heart of a definition of any craft practice lies the idea of applied, skilled understanding and mastery of material (McCullough, 1998, 22). Regardless of medium, craftspersons must demonstrate an understanding and mastery of their will upon their chosen material. The musician, painter, sculptor, or writer must, in order to communicate effectively, understand the *essence* of their material, its structure, its parameters, and its pliability. It is the demonstration of this *understanding* that has traditionally been equated with the great skill of the craftsman. The implication is that this mastery is gained from a theoretical position (textbook knowledge) plus practical experience (tactile knowledge). Manipulating, "crafting" the material is a balance between the physical forces of hand-work and invisible forces of intellect and understanding, a notion which is most clearly and consistently argued through the work and writing generated by the Arts and Crafts Movement.

Founded as a reaction against the industrialization of creative practice, the Arts and Crafts Movement was driven forward by ideological principles that informed the nature and style of the work. For Ruskin and Morris, founders of the movement, the crafted object was never to be considered in isolation. Its wider significance and value were calculated in terms of the surrounding forces that helped shape it. The value of the crafted artefact had as much to do with the *invisible* approaches and attitudes of the craftsman as the beauty of the finished piece itself (Boe, 1977, 107). The final object thus gained significance as being a manifestation of the mental and physical engagement of the craftsman, a product of the balance among the three key themes of material, humanity, and environment. The practice of craft can therefore be seen as a unification of the head and hand, the thought and actions of the creator upon a given material (McCullough, 1998, 29). What happens, then, when the material changes and becomes the new material of a technological era? Do the ideals of craftsmanship alter? Is it possible to craft a new, technological material? These questions are important when considering a wider historical view of programming used in a creative context. Before considering this issue, it may be constructive to briefly consider the characteristics of digital material.

## New Material

Whereas traditional materials typically exude qualities of solidity, stability, and uniqueness, the virtual, temporal nature of digital material is more closely associated with ideas of formlessness, invisibility, and instability (Betsky, 2000, cited by Poynor, 2003, 113-114). The physicality of old, traditional material has been replaced by the "virtuality" of the new digital material.

Digital material is *formless*; it cannot be touched or handled but exists rather as a concept in the mind of the computer user. The non-physical material of the digital realm is closer to the realm of ideas and thought than the real, solid substance of traditional media. Decisions about the final form of the digital object therefore do not have to be founded upon the reality of physical dimensions; there are no physical barriers to the creation of the object. Digitally created pieces of work can be saved and re-saved into multiple versions. Elements of the code can be copied and pasted and redistributed to a mass audience. Creation of a programmed piece is not dependent upon a tightrope margin of error between success and failure associated with hand skills; errors with digital material can easily be deleted and re-edited. It is a medium not of originality but of *multiplicity* (Watson, 1998).

Digital material is also *unstable*; it lacks the stability and certainty of traditional material. The unchanging physical qualities of the "old" materials maintain an important element of history and continuity from one generation of artists to the next. In contrast, however, the technology of digital material is based upon less solid foundations; it is in a constant state of flux (Berry, 2001). It does not share the history or continuity of traditional materials, which play such an important part in the generation of a craft tradition. Has the material of creative production altered so much that the idea of craft can no longer be applied to it? Is there any place for skilled mastery or craftsmanship of the digital material?

## Craft-Like Attitudes

The non-physical nature of the new material means that comparisons with traditional forms of craft may seem to be fruitless. However, if we consider a broader "Arts and Crafts" definition of craft (one that encompasses the idea of craft as an *attitude* or ethos in the skilled manipulation of a material), then significant comparisons can be made. A consideration of craft in terms of attitude toward material, humanity, and environment offers up interesting areas of commonality.

To use computation in a creative context is to *understand* the material. The programmer must understand and speak the language of the computer in order to master the tightly structured, unforgiving rules of programming syntax and structure. Just as the craftsmen of

the Arts and Crafts Movement sought a deep, skilled understanding of, and harmony with, their material, so the application of programming in the creation of artwork demands a similar understanding of the computer material. Programming requires a disciplined and rigorous approach, and the development of creative work demands a thorough understanding of the structure and grammar of the code. Realizing the true potential for programming as a means of generating creative work involves a systematic process of learning and development. This "apprenticeship" process can be likened to that undertaken by masters of traditional crafts, in which a thorough understanding and mastery of material is developed through careful practice and application. The understanding of computer code, gained from systematic practice and application, affords greater understanding and mastery of the computer material.

Using programming to create a piece of art or design requires an abstraction of thinking, translating the idea of the final visual form into a structure required to create the work. A leap of understanding is required to translate a creative idea into a piece of code. Creative ideas and solutions are thus abstracted into structures and objects that are "natural" to the computer material. Such an understanding of material subsequently creates work that echoes the invisible structure of the code. Mathematical procedures and geometric structures, which are fundamental to the medium, are often utilized in the creation of work. Repetitive patterns, growing organisms, self similar patterns are all mirrors of the computational structures that generate them.

The use of programming, as a way of manipulating and understanding the new material, also represents the means by which artists and designers are able to get *closest* to the virtual material. When they use programming to create a visual work, the underlying process and structure become of fundamental importance. The invisible structure of the work becomes as significant as the final outcome. The work experienced by the viewer is a visual translation of the underlying framework and "mental engagement" of the artist or designer with the material. In direct contrast to the post-modern point-and-click, cut-and-paste approach to creating a piece of creative work, the use of programming requires that a framework is firmly established, around which the work is built. For example, it is interesting to note the emphasis placed on the process and structure of programmed interactive work. ART + COM published various "sketches" of their large-scale interactive works, which include samples of code, highlighting the importance of the invisible process and structure that underpin the artwork.

Another characteristic of artists or crafts people who truly understand their digital or traditional material, its boundaries and capabilities, is the ability to use minimal material in the creation of work (economy of material). The superior programmer, just like the superior craftsman, can generate more efficient results from a minimum amount of code. Elegant programming, as in the craft process, structures the material in such a way that maximum use is made of minimal material.

Ruskin and Morris also observed that a key element in the value of the craft object is its *humanity*: the object as a representation of the artist's skill, satisfying the basic human urge to create form from raw material. An important facet of the craft object is its link to the human process of creation. Just as the unformed block of wood or clay gives the craftsperson raw material to begin sculpting, so computer code gives the artist a "blank canvas" with which to manipulate the computer material. Working with code in a creative context thus satisfies the same fundamental human urge to create, to generate something from nothing. The directness of the process of programming with the computer allows the creator to directly manipulate the material without added software intervention. Code, therefore, opens up the computer as material for the programmer to work with, allowing skilled individuals to exert their ideas upon it and through it. The result of this process is that the programmed object itself may be considered as a type of hand-crafted piece of work, a manipulation of raw computational material as an expression of the practised skill and mastery of its creator.

The idea of environment, the third key factor in the work of the Arts and Crafts Movement, is also reflected in the character of coded work. The source of much program-based visual artwork comes, directly or indirectly, from the environment, either as source data for work or as inspiration from the creation of organic "life." The computer as "reactive" material (Maeda, 1999) uses code to translate the sights and sounds of the environment into visual, interactive data. Programmed pieces of work are thus sympathetic to their surroundings; they become environmental pieces of work. Even the language of programming reflects the language of nature. The mathematical basis of computation intrinsically links it with the geometrical structures of natural growth and form. Fractal images, organic growth, self similarity, etc. are all ideas that originate in the natural world but which are often inspiration for and replicated by computational structures, in the digital realm.

**Artefacts**

Having now compared attitudes toward both digital and traditional material, the final consideration is for the artefact itself. How can digital and traditionally "crafted" objects be compared? The traditional craft process culminates in the finished hand-crafted artefact. Likewise, when programming is used as a creative process, then the result may similarly be considered to be a digital"'artefact." Each of these artefacts is a product of the material and the processes that formed it; each reflects the nature and characteristics of its own material. The solidity and "reality" of the traditional object exhibits the singularity and stability of its material: its form is fixed, reliable, and physical. The virtuality of the digital object, by contrast, has no fixed form and inhabits no fixed space. It lives, distanced from the viewer, within the environment of any number of computer screens. The nature of the digital object denies its viewers the physical, tactile experience afforded by the traditional craft object.

The tactile, physical quality of a piece of traditional crafted work is a highly important element in the viewer's understanding and appreciation of the work: visual and sensual experiences combine to present to the viewer a greater understanding of the object's quality. Although the digital artefact cannot be physically touched, wider sensual experiences of a programmed piece of work play an important part in the overall quality of the artefact. A sensory experience of the object within the digital realm is manifest through the use of digital "sensations" (moving image, sound, and most notably interaction). The use of interactivity within programmed pieces of work provides a particularly interesting resonance with the human experience of seeing and touching a piece of traditional craft. Digitally programmed objects that involve human interaction (especially those that replicate physical properties such as gravity, elasticity, inertia etc.), can

engage the viewer in a kind of intuitive, sensory experience that evokes the same type of emotion and delight gained from handling a well-made, physically crafted, object. John Berger describes his visual pleasure while viewing some hand-made white birds, objects that express a "respect for material," "unity and economy" (Berger, 1985 cited by Thackara, 1988, 23) of design, and the "mysterious skill" of their creator. This experience of encountering a well-crafted object that expresses the character of its material and the mysterious "how did they do that?" skill of its creator is echoed when viewing beautifully created digital artefacts (a J. Maeda or G. Levin piece, for example).

The second significant characteristic of the traditionally crafted object is the notion of its uniqueness, its "aura." A hand-crafted piece of work gains status from the fact that it has been individually created, and that once born into existence, no exact reproduction of it will exist. The digital object, however, is a product of the copy-and-paste world of the computer environment. Once created it can be endlessly produced and re-produced across the globe; even the "original." hand-written code can be copied from elsewhere. The digital object is not characterized by its singularity but by its multiplicity. It is this very idea of multiplicity that may give us an understanding of the "aura" of the programmed work. Programmed pieces of creative art or design work are *dynamic*. In a state of constant flux, they typically have no single fixed state of being. During the course of its life-cycle the visual elements of a programmed object will alter and shift in response to different or even random environmental stimuli (time, human activity, etc.). The building block to all programming languages, the variable, creates a framework in which the notion of variance is a fundamental characteristic to any programmed object. The result: each time a user views a digital object it is likely to be configured into a different form; no two copies of the same object will provide exactly the same experience. It is the variance, the multiplicity, of the material that gives each object its individuality, its uniqueness, its "aura."

**Conclusion**

The initial understanding and definition of craft, in terms of a physical (visible) and cerebral (invisible) process, has afforded a wider vision of the role and importance of programming with regard to its dialogue with the digital material. Using the emphasis which Morris and Ruskin placed on the approach and *attitude* of the craftsman for his material, it has been possible to consider how programming, when used as part of a creative process, can echo the craft-like concerns and attitudes of the traditional artist. Each new revolution in material technology has brought with it artists and designers who seek to understand and use the material of the age. The intellectual engagement with, and concern for, the digital, virtual material of the artist-programmer may therefore be put alongside the Arts and Crafts tradition, with which it shares an ethos and outlook.

The implications of this central idea allow consideration of this new, digital material in the context of a wider discussion of the relationship between artist and material. Specific reference to the Art and Crafts Movement has provided particularly instructive comparisons, allowing a re-examination of the role and status of programming as a means of manipulating or crafting digital material. Despite the physical differences between traditional and digital material, we have seen how the use of programming constitutes a way of approaching and engaging with digital material, which has synergy with a traditional Arts and Craft ethos. The fundamental importance that both traditional craft and computer programming place upon the notion material emphasises this commonality. Both processes highlight the need of the creator to engage with and understand the essence of their "material" on a fundamental level. The physical boundaries and restrictions of traditional material (clay, wood, etc.) and the virtual, intellectual boundaries of programming syntax and structure demand a disciplined approach to each material if it is to be moulded and mastered. The emphases that Ruskin and Morris placed upon the wider moral and intellectual aspects of craft as a process correlate with similar attitudes and concerns shared when using programming as a means of engaging in creative practice with computational material. Artists who create digital artefacts by using programming share much common ground with crafts people who create artefacts from wood or clay. The material may change, but the underlying ethos and attitude remains. Programming as a means of creative practice provides the best way for an artist to engage with, sculpt, or manipulate the computational material. It has significant resonance with the ideals and ethos of the craft process. The artefacts created from the process have resonance with traditionally crafted objects and thus demand a reclassification of its status as a utilitarian process of engineering to a type of digital craft.

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