

Digital Ground: Architecture, Pervasive Computing, and Environmental Knowledge

Review by Henri Achten



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Malcolm McCullough
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Ubiquitous computing is a fact: we are surrounded in our daily life by an increasing number of (integrated) systems. As Malcolm McCullough notes, since about 1994, there are more microprocessors than there are people, and around the turn of the millennium, this ratio has reached about 100:1. Such processors are used for surveillance, registration, service, control, communication, and so forth. They are on us, in us, and around us. What to make of this presence? How does this alter our behaviour, and more in particular, how does it alter architecture as the stage for our behaviour? This is what Malcolm McCullough sets out to investigate.

As information technology and hardware develop further, they move from technological enablers for specific problems to “ambient social infrastructure.” This, in McCullough’s view, puts it on equal level as architecture. It also means for architects, that more conscious than before, they are to act as *interaction designers*, rather than stage-setters. What both disciplines thus have in common is the creation of place – even though the Modernist tradition has by and large tried to erase the notion of place from functionalist consideration. Nevertheless, through the ages architecture has established a wide body of practices and understanding how to shape and articulate place.

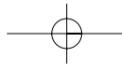
According to McCullough, the understanding of *place* has for too long been dominated by an objectivist view that differentiates between understanding of place and *being in place*. In fact, he devotes chapter two just to defuse this contradiction, and to provide a case for embodied understanding. There is a lot of material to discuss here, and McCullough provides a deft and dense reading informed mainly by phenomenology. Given his defensive outset, the opposite position of mainstream cognitive

science and philosophy is represented as a rigid, mechanistic, two-worlds operating discipline. Although such dramatic juxtaposition makes us aware of the issues at hand, it also leads to strangely construed misunderstandings that could have been avoided by a more balanced exposé. That our understanding of the world is a physically grounded experience, which is continually restructured, is recognised by many researchers and theorists, without necessarily making them phenomenologists as the author would have it. Notwithstanding these points, McCullough rightly claims that the shift in focus and awareness is valid and worth more attention. What we need to tap into to better understand place again he claims, are the environmental predispositions (skills and structures for dealing with the environment) developed in architecture and more recently in information and interaction design.

One of such pieces of knowledge is the *type*. For McCullough, this is not so much a functional classification, but rather a complex set of principles that can generate a particular approach and social setting; an example is the town square. Important of such types is that not only they accommodate particular uses and settings, but they also signify this particular use. The richness of type, and the skill of playing out different types in an urban setting, is an important antidote to simplistic functionalism – a danger also facing interface design. For the case of architecture, McCullough points out that technological changes hardly ever caused types to disappear, but rather strengthen them or enable the existence of new types. Thus where interface design and architecture meet is through the creation of *peripheral awareness*: for interface design through reference to architectural types, and for architecture to the understanding of ‘quiet’ architecture rather than the tyranny of the eternal new and unexpected.

Computing is moving towards network infrastructures and ubiquity. Essentially, this boils down to a multitude of devices that are situation-aware, which have means to change some aspect of a situation or themselves, and which can fine-tune or adjust their behaviour. In order to keep the daunting complexity of such systems in check, McCullough posits that type provides the stable configurations necessary. As type often is associated with some idea of a place, e.g. town square, library, house, etc., the notion of location is important to understand. In interaction design this is generally referred to as *location models*. The central question to ask about a place is, “who is there, and what do they want to do?”

The notion of location models becomes key to McCullough’s argument. In order to tackle the more futuristic possibilities, it is necessary to establish a classification of *situated interactions* that may take place in a location model. The author proposed a preliminary list of 30 situational types, organised in the groups “at work” (e.g. deliberating and presenting), “at home” (e.g. sheltering and recharging), “on the town” (e.g. gathering and cruising), and “on the road” (e.g. adventuring and walking). These examples



show how the notions *place*, *type*, and *location model* are the driving factors to understand what forms of ubiquitous computing are desirable in each situated interaction. This is quite distinct, McCullough argues, from the general tenet of ubiquitous computing, and thus it is very important for architects to resist this and to insist on situated computing.

The central thesis of McCullough's book then is this: "Interaction design must serve the basic human need for getting into place. Like architecture, and increasingly as a part of architecture, interaction design affects how each of us inhabits the physical world." (p. 172). Place is important because it established the occupant (whether it concerns architecture or devices) in a community of which he or she is a member. Place is also important because it matters to us, and thus we value it. Finally, place is important because it properly focuses what we need, what we want, and to which measure we need and want.

Digital Ground's defence of place and architecture is very sympathetic – and it touches some important truths that we have to be aware of. Unfortunately, many of these important observations are presented only after long and winding considerations, showcasing what the author has been studying, rather than coming to the point. The reader is warned in the preface, where McCullough writes that this book "is only an invitation to share in the author's inquiry." (p. ix). This severely hampers the accessibility of the material to the interested reader, be it an architect or interaction designer. For someone who does not already have a well-informed background in architecture and at least a mild interest in information technology, the book is not helpful since key concepts are not introduced nor clarified, illustrative material is lacking, and there is too much appeal to some profound kind of understanding what architecture is about. After reading this book, an interaction designer will not have gained clear and instrumental notions how architecture can help, or how he or she can be involved with architecture. This is a missed opportunity. *Digital Ground*, to conclude, is interesting for those in the know, who have not yet given much consideration to the phenomenon of ubiquitous computing.

