1 Introduction

In this paper, I want to open up some possibilities for theoretical self-criticism among computation-based architects, that self-identified group of practitioners, teachers, and artists who have assumed the promotion of “digital architecture.” I am interested in identifying and describing those practices that are misidentified as “digital.” What characteristics of architectural education, research, and practice account for the creation of “digital architecture?” What is possible and not possible to do with the current research program concerning computation, data, and information?

I think it is important to note that “digital architects” are a self-identified group. The extent to which we routinely distinguish so-called digital architecture from other kinds is baffling. There is a bewildering gate-keeping practice marking out digital practice. Architecture has been entangled with computation for half a century. Today, no new building is built without plans drawn with CAD, tested on the basis of software analyses, and delivered with presentation drawings rendered with graphics programs. In commonsense ways of speaking, all architecture is now “digital.” Yet no matter how much computation is involved in designing, engineering, building, and presenting the typical library or stadium, house or hospital, only a small number are called “digital.” The term designates only the work of a very small group of people, and not the state of architecture as a whole.

I am not going to attempt to explain or justify or criticize this digital sodality. But I do want to make explicit that the issue is not some general problem of data processing, or a necessary result of a digital revolution. The explanation has to be sought within the discipline. Is there a way that “architecture” is the key part of the term “digital architecture?” Is there a difference between digital design and digital architecture, for instance? Or is there a useful distinction between design and architecture that carries over to information-based practices? If digital architecture is about computation, data, and information, what are architects, who are not computer scientists, supposed to bring to “digital architecture?”

In the interests of being provocative, I am going to proceed episodically, rather than systematically, discussing the issues of body, pleasure, and relevance.
2 Body work

The first issue concerns bodily experience and tacit knowledge. One way of conceiving what distinguishes digital from other kinds of architecture is that using the computer cuts architectural practice off from a long history of training the body. Historians have suggested that a similar rupture occurred with the emergence of graph paper (Collins, 1962). The notion is that what characterizes “doing architecture” is not a purely mental practice, but rather a physical experience using a ruler and compass in geometrically based drawing. For centuries, learning architecture has been training the body to hold certain positions and perform certain movements. Typing and mouse clicking, two new bodily gestures, are foreign to the long history of humanistic training in geometry. Today’s digital architects are literally not doing the same thing as architects have done since Vitruvius.

One sign of this anxiety about bodily experience is the uncertainty about when to introduce computers in architectural education. If we agree for a moment that architecture is a set of bodily gestures and not just mental representations, then the widespread idea that students have to learn hand drawing before learning how to manipulate data appears as a curious (and probably futile) attempt to reconstitute within the few years of a degree program what has been ruptured through historical change. The root of our anxiety thus might be anthropological: what’s at stake is cultural loss.

There is no persuasive argument here. I intend only to demonstrate that there could be strong arguments about what digital architecture is, what makes it different from architecture, made from historical and anthropological starting points. We can say something definitive about “digital architecture” without attending to computation at all: nothing about the mathematization or quantification of experience, nothing about architectural form, and nothing about manufacturing and assembly.

3 Architecture is interpretation

My second episode begins with the assumption that architecture is an interpretative practice and not a scientific one. Data and information lie on the side of logical consistency, while architecture lies on the side of cultural understanding. If architecture is indeed a practice of cultural representation rather than a natural science, what would link it to information science (Dear, 1995)? Is it enough that computation is a metaphor, allegory, or tool for designers to wield? Or does architecture have to attend to some aspect of culture that is not available as (parametric) data?

As an illustration of the contrast between computation and interpretation, think of the anecdote often used to indicate how statistics can go wrong. A man who stands with his feet in a bucket of ice and his head inside a hot oven, may, on average, feel fine, but can hardly be said to be comfortable. The optimized, comfortable room temperature is not simply the statistical average of all measurable temperatures.
Actually, in this example, it is a straightforward process to see how computation and design can come together: the extremes are too far apart, the variables too heterogeneous. The situation, then, as far as ambient temperature is concerned, is quite readily controlled and designed digitally. Indeed, comfort can here be defined by establishing better ranges for parameters through laboratory testing. The design could presumably account even for perceived temperature, that is, it could comprehend the psychological fact that when people have control over the temperature setting, they are more likely to be comfortable.

But if this is digital design of the physical environment, it is still not yet architectural interpretation. I am sure you can imagine people who would find the ice bucket and oven situation tantalizing, stimulating, even pleasurable: pleasures can involve perverse situations that are not necessarily comfortable. Surely part of architectural practice is to attend to these pleasures, not just comfort. It is self-evident that pleasure is culturally bound and socially constructed, not merely physiological. So what “parameter” could account for pleasure? Again, I’m not claiming this example constitutes a persuasive argument. I intend it only to show that it is at best unclear that “digital”—information, computation, and data—has any particular advantage or insight that helps us to identify, support, or celebrate, through architecture, this particular kind of cultural interpretation.

4 Dreyfus

The problem of interpretation is possibly the theoretical problem for digital architecture. The fundamental importance of the cultural, interpretive moment that leads towards meaning rather than data has been theorized several times and in several different ways in the twentieth century. In association with computation, I would like to briefly discuss one famous example, namely, philosopher Herbert Dreyfus’s critique of artificial intelligence (Dreyfus, 1972, 1992; Dreyfus et Dreyfus, 1986).

Dreyfus was at MIT when researchers made their first predictions that it was possible for a computer to achieve human-like intelligence. For artificial intelligence researchers, the human mind works analogously to a computer, relying on a physical symbol system (made up of neurons) to represent the external world. Dreyfus countered that human intelligence does not follow formal rules of logic, and thus, since the underlying analogy is false, the research program would “degenerate.”

Among other philosophical stumbling blocks, Dreyfus identified relevance as a key problem. Even if the computer could store all of the information about the world that is in the world, how would it decide which of those facts were relevant, significant, and valuable? Surely human intelligence, he claimed, does not work because the human brain has access to all possible facts about the world. Instead, human beings acquire facts and skills (riding a bicycle, clicking a mouse) through direct bodily experience against a background of such bodily experiences. In short we have no computational system that allows us to model how things become significant in the environment that duplicates how they are significant to us as human beings.

Yet Dreyfus was not saying that it is impossible for a machine to model human intelligence, just that going about it as if the brain was a computer was misguided. One outcome of his identification of a limit, however, was the push to reorient the research program. Dreyfus also claims that the limits of data manipulation are nowhere near being reached. Between simple smart machines and true artificial intelligence, there is a long expanse of “relative smartness” that could have valuable, interesting, even revolutionary effects. Specifically, researchers can use brute computer power; algorithms do not have to map directly on to how human intelligence works.
Dreyfus’s critique of artificial intelligence is directly relevant to clarifying the categories of digital architecture. There are design and construction problems that can be readily optimized through brute-force calculations: any domain that is formal (in computer science terms) and where the goal itself can be clearly specified beforehand is surely amenable to computation. But architecture, which is interested in such intuitive and formal topics (in architectural terms) as composition, rhythm, pattern, and appearance, is intimately bound up in the “relevance” problem. There are no clearly specifiable goals for beauty, pleasure, or for cultural relevance.

5 Conclusion

To sum up, organizing a relevant research program for digital architecture is hindered because it is difficult to distinguish digital architecture from other kinds of practice. To date, the manipulation of information in architecture has mostly succeeded as a sociological manoeuvre—involving particular networks of people—rather than as a response to architectural capacities. Clarifying the limits of digital architecture practice necessitates looking outside the question of computation to complex problems about intelligence, psychology, and culture.

One further comparison. Consider the current research and practice of sustainability as a type of architecture. It has rapidly turned from marginal to mainstream, so that it no longer seems available for what counts as architecture; rather, all architecture should be “sustainable” in the same way that construction should be waterproof, fireproof, and the egress secure. In other words, it is more and more relegated to a non-determinate, if important, component of architectural practice, unable to inflect the core areas of what makes architecture meaningful. (Likewise, fireproof construction was once touted in the rhetoric of up-to-date practice.) Yet sustainability—or fireproofing—is always still available to be thematized as architecture. That is, designers can establish the relevance of foregrounding sustainability in particular projects. But they cannot establish it in principle, since ecological considerations are fast becoming the background of all architecture. The same applies to digital practices.

References