In & of: Unstructured planning / ambient literature

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Marcinkowski, M. (2016). In & of: Unstructured planning / ambient literature. University of Birmingham Centre for Contemporary Literature and Culture. Birmingham, UK.

Introduction

It's tough to talk about ambient literature right now, largely because it is something that doesn't properly exist. I mean this in two ways. First, ambient literature is conceived to function as an emergent literary experience which isn't fully "there" until it is activated by the reader and their context. Second, ambient literature doesn't properly exist because it hasn't been invented yet — the very idea of ambient literature is yet to be fully defined. No proper examples of it yet exist. The goal of this two year project (Abba, 2015; Dovey, 2016) is to sketch out a conceptual space of literary and data interactivity, and to instantiate the specific object of ambient literature which puts forward this particular techno-literary perspective.

Here, at this early stage, I want to focus on the influence that human-computer interaction theory has on the project and to discuss how the history of the influence of cognitive science on human-computer interaction can help us to clarify both the function of individual works of ambient literature and the developing nature of the project as a whole. At these two levels, ambient literature raises questions regarding the nature of planning, formalization, and the emergent behavior of individuals, groups, and computer systems. These issues are fundamental in the history of human-computer interaction and I want to address them here through the reading of a debate in cognitive science that surrounded the development of the idea of what was termed "situated action." As will be discussed, in contrasting situated action

with the physical symbol system hypothesis, this debate raised questions of the ontological and epistemic possibility of planning and the formal representation of planning in computer systems. In reading this debate for some provisional guidance as to how best understand ambient literature, I want to gently open the door to the possibility that materialist (e.g. DeLanda, 2006), realist (e.g. Barad, 2007), and object-oriented (e.g. Harman, 2002) approaches might help us understand something like ambient literature. I'm not going to discuss any of these in particular, but I want to keep them in the background moving forward.

The Problem of Embedded Socio-technical Systems

To start, I want to build on what has already been said and quickly frame the question of ambient literature in two particular ways.

First, I want to characterize ambient literature as a mode of socio-technical literary engagement in which the formal and planned literary text or application is responsive to and dependent on a reader's specific and unstructured context.

And second, I want to consider the broader nature of the ambient literature project itself as it hinges upon planning and the integration of disparate efforts which are rendered across a semi-scientific grid of verification, milestones, deliverables, path-based dependencies, and so on. In this, the ambient literature project is also a socio-technical assemblage which interleaves questions of planning and formalization across a field of action.

What I hope that a discussion of this debate is able to provide is a starting point for developing a common foundation for understanding these two socio-technical questions (of ambient literature

and the development of ambient literature), each of which is embedded within the other. As a thing, ambient literature cannot be separated from the situation of its creation.

The Debate: Physical or Situated

While the debate that is the focus of this talk appeared in a 1993 issue of the journal *Cognitive Science* (Agre, 1993; Clancey, 1993; Suchman, 1993; Vera & Simon, 1993a, 1993b), the foundation of the debate began with the appearance of situated action in 1987, particularly as it was put forward then in HCI by the anthropologist Lucy Suchman (1987). Building an approach to understanding the cognitive maneuvers involved in human engagement with technology and the subsequent reciprocal considerations of the design of technological systems, Suchman (1993) argued "that behavior can only be understood in its relations with real-world situations" (p. 74); that is, it is the lived context and not a pre-given sense of a plan that is the main driver of human activities and the systems that are meant to emulate and interact with them. (This idea was developed in her work at Xerox where she studying the use of copy machines, videotaping people trying to use new "intelligent" copy machines, which lead her to come to understand interactions as not being defined according to a pre-given plan, but rather to be defined in a responsive manner.)

In her critique of the then contemporary approaches to planning in artificial intelligence, she utilized the example of the person guiding a canoe through rapids (Suchman, 1987): Whatever sense of planning one establishes before the fact, when faced with the indeterminate paths offered by the rapids, a more immediate and unplanned response is relied on to successfully navigate them (note the possible resonances with a general program of cybernetics here). Put

simply, the question of the pre-formulation of plans in an unstructured environment was answered by a mode of situated cognition.

On the surface, this approach differed from more classical takes on cognitive modeling, particularly the physical symbol system hypothesis as put forward by Allen Newell and Herbert Simon (1976) more than a decade before. The basic idea behind the use of physical symbol systems for cognitive modeling is that a set of elements represented in some *physical* form (ranging from patterns of electromagnetism in computers to other forms in the human brain) are manipulated in the processes of cognition. These symbol systems store symbols and symbol structures, with these systems interacting with the environment through the intake of stimuli and subsequent initiation of motor functions. In this, the work of planning is given physical and specific form. Importantly, "'symbolic' is not synonymous with 'verbal'; symbolic structures may designate words, mental pictures, or diagrams, as well as other representations of information" (p. 10). The physical symbol system hypothesis represents a version of information processing and is reflected in early models of use in HCI, such as the model human processor (Card, Moran, & Newell, 1986).

So, as situated action proposed that cognition was dependent on a responsive engagement with the environment, the physical symbol system on the other hand proposed that cognition could be internalized in a physical system.

The rise of interest in situated action was taken, rightly or wrongly, as an affront to the proponents of the then well-established physical symbol systems hypothesis. In particular, Alonso Vera and Herbert Simon (1993a) authored an article which cast the idea of situated

action as unnecessary and (in the best form of competition between scientific theories) that its claims were able to be summarily managed if placed in terms of physical symbol systems. As they put it, “[Situated Action] is perfectly compatible with symbol systems” (p. 81) and that they could see “the basic explanation for SA in the information-processing mechanisms that underlie this hypothesis” (p. 83). Instead of approaching the question of human action as something that relied on the specific environment of its occurrence, Vera and Simon saw the possibility for a physical instantiation of cognition. In arguing against Suchman’s claim for the need for immediate and unplanned responses to the environment, they laid out a direction for the development of small scale systems of planning within cognitive models which were able to be deployed by the physical symbol system in response to a variety of novel but not wholly unfamiliar situations. In this, based on encountering certain environmental affordances, the system would be designed to activate certain pre-planned and structured responses. Such a system, they asserted, would be able to be equivalent to any human actor’s supposed situated cognition.

Suchman (1993) responded to this, turning the theoretical discussion on its head, asserting the primacy of situated actions over even physical symbol systems, saying that plans (such as might be represented in physical symbol systems) are just “one among many things that situated actions produce” (p. 73). For her, the ultimate grounding of any determination came in the situated interaction, whereas for Vera and Simon it came in the physical thing of the symbol system. In this, there is a basic and fundamental divide.

This was stated clearly by Vera and Simon (1993b) when they said that there was a distinct contrast “between the highly subjectivist world [Suchman] lives in and the relatively objective

one we think we live in" (p. 82). This kind of division goes on to inflect almost the whole of ubiquitous computing research in which there is a fundamental divide between how to engage objective and subjective considerations of user context.

In thinking about ambient literature, this divide is important given ambient literature's reliance on a sense of objective and pre-given symbolic structures which are made to interact with subjective, unstructured, and variable contexts, both in terms of a literary text and a technological application.

As Vera and Simon pointed out, the context of cognition is too complex a thing to always be considered in an immediate sense, and as such necessitates the reliance on the storage and retrieval of symbols and symbol structures relating to that context: Input from environmental affordances offered as part of a complex situation serve not to directly guide action, but to activate relevant stored structures relating to plans. The question remains, however, how features such as affordances are themselves selected. Complexity seems to be engaged not just within the limits of sensorial perception, but also beyond and previous to such limits.

For Vera and Simon (1993a), what they see as the claim of hard situated action "that behavior can only be understood in the context of complex real-world situations" is "surely wrong, because no organism, natural or artificial, ever deals with the real-world situation in its full complexity" (p. 45).

Suchman (1993) responds to this by correcting their characterization, saying that the idea of situated action should be instead formulated as stating "that behavior can only be understood in

its *relations* with real-world situations" (p. 74, my italics), and that she "cannot imagine what it could mean to deal with a situation in its 'full' complexity, because situations are not quantities of pre-existing properties dealt with more and less fully" (p. 75).

In this cross talk (Agre, 1993), both sides miss the real value of Vera and Simon's raising the question of complexity. For Vera and Simon, the distance taken by an organism from the "full complexity" of the "real-world situation" is precluded by the unavailability of a direct relationality with that complexity which underlies systems of affordances, while, for Suchman, a "real-world situation" is based on such relationality without recourse to any thinking of complexity at all. I would argue that the central issue in both cases is not the fact of, but the question of the relation and what it entails under really-existing and complex conditions of context.

I want to highlight that in the onto-epistemic perspective that is beginning to be developed here and put forward by the proposition of ambient literature which asserts the situated *and* symbolic nature of occurrence, there is no possibility for any dealings with a situation outside of its full complexity. A situation is as it is; complexity is as complexity does. It is the full complexity of the situation, whatever its relationship with cognitive mechanisms, that rises up, producing situations, physical symbol systems, and cognition in general.

The idea that complexity and the relations that it brings about are the real prime movers in thinking about planning is reinforced by the methodological idea proposed by John Carroll and Wendy Kellogg (1989) that the HCI artifact serve as the locus of a kind of theoretical embodiment. In arguing that "virtually every aspect of a system's usability is overdetermined by independent psychological rationales inherent in its design" (p. 7), they made clear that "[t]he

essence of this approach is to view artifacts not through the filter of an isolated theoretical abstraction (e.g., a grammar-in-the-head) nor, without abstraction, as an unbounded collection of idiosyncratically interpreted, specific instances" (p.13). Arguing against a hermeneutic rendering of the field of HCI, they said that "[t]he hermeneutic vision is correct in stressing the multiplicity of relevant interpretations of situations, users and artifacts, but too easily conflates multiplicity and infinity, settling for indeterminate subjectivity" (p. 13). For Carroll and Kellogg, the question of parsing the complexity of an artifact comes as less important than what it does in total. In this, they seem to argue for a mode of determinate subjectivity which might encourage both situated and symbolic notions of cognition when considered in HCI.

Why Ambient Literature Matters

This debate is important for ambient literature in general as it was foundational in the development of approaches in HCI and ubiquitous computing on which ambient literature is built. But is is also important for the more specific reason that ambient literature is composed of both symbolic and contextual concerns. Works of ambient literature are concerned equally and in explicit ways with both text and context. On the one hand, works of ambient literature are driven by the pre-formation of the authorial text: the narrative or text that is given to the reader/participant in the form of a book, audio track, or application that they then follow along with. On the other, ambient literature is driven by the situated context of the reader that encourages the experience of the text to unfold in a particular, yet unpredictable, manner.

At both the level of the individual work and the project of defining ambient literature as a whole, the question of complexity and the relationality between something simple (like a symbol or a

gantt-chart) and something complex (like an emerging context or idea) comes to be the center of a productive event.

Across both these dimensions, the picture developed through a consideration of symbolic and situated approaches, in either case, enforces a conceptual regime of productivity and a focus on the questions of a realistic cognitive engagement — a cognition which, following the furthest implications of the physical symbol system hypothesis, is concerned with a realism of material and objects.

In this light, opportunities for thinking about ambient literature are able to come from a number of perspectives, including Delanda's assemblages, Harman's objects, or Barad's sense of intra-action. This cluster of distinct, sometimes contradictory (Harman, 2016), and yet thematically-similar approaches seems to offer a good opportunity for the continued working out of the question of ambient literature.

In the end, perhaps ambient literature should, like Carroll and Kellogg's consideration of the theoretical role of the HCI artifact, be thought of as a kind of weak theory (1997; Vattimo & Zabala, 2011) which allows for a multiplicity of interpretations. Ambient literature, both as a general idea and as a specific work itself, presses to dissimulate itself from the planned vision of the author (or the project organizer) and seeks to put forward only a weak conception of what it is and how a work should be. Going further and in a more fundamentally provocative way, an examination of the theoretical basis of ambient literature begins to raise questions regarding the possible weakness of concerns as basic as consciousness, agency, individuation, and meaning. In establishing this sort of still developing and widely welcoming structure, ambient literature, as

an idea, provides a distinct alternative to other ideas of a technological literature. Having an eye toward the wider world and our own technological engagements, it provides an open and variable idea of what the role and implications for this kind of literature can be.

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