Fundamentos Teóricos do Geoprocessamento: Aspectos Conceituais

Aula 1

O texto abaixo é um extrato de um artigo que se encontra na Internet, na Página pessoal de Phil Agre, em http://dlis.gseis.ucla.edu/pagre/. A importância do texto de Agre, no contexto de nosso curso, é examinarmos desde o princípio, em completude, os elementos do universo que estamos lidando. Assim como a Área de Inteligência Artificial tem estado nas ***"borderlands"*** , como diz Agre, esta coisa chamada "geoprocessamento" é sempre ***"fronteira"***. ***Fronteira*** entre Engenharia e Ciência, entre Tecnologias e Metodologias, enfim ***"fronteira"***.

E o texto de Agre nos alerta para sempre observarmos que, trabalhar com um instrumento tão ubíquo (aquilo que está ao mesmo tempo em toda a parte !) como o computador digital tem sido nas últimas décadas, merece sempre uma atenção redobrada, e uma reflexão crítica sobre os "*produtos*" que com/e/ou através dele produzimos como representações dos fenômenos que se desenrolam no espaço geográfico e seus territórios produzidos.

University of California, Los Angeles
Los Angeles, California 90095-1520
pagre@ucla.edu
(310) 825-7154, fax (310) 206-4460
http://dlis.gseis.ucla.edu/pagre/

Toward a critical technical practice: Lessons learned in trying to reform AI

Phil Agre

This is a chapter in Geof Bowker, Les Gasser, Leigh Star, and Bill Turner, eds, *Bridging the Great Divide: Social Science, Technical Systems, and Cooperative Work*, Erlbaum, 1997. Please do not quote from this version, which changed slightly before appearing in print. 11600 words.

1 Introduction

Every technology fits, in its own unique way, into a far-flung network of different sites of social practice. Some technologies are employed in a specific site, and in those cases we often feel that we can warrant clear cause-and-effect stories about the transformations that have accompanied them, either in that site or others. Other technologies are so ubiquitous -- found contributing to the evolution of the activities and relationships of so many distinct sites of practice -- that we have no idea how to begin reckoning their effects upon society, assuming that such a global notion of "effects" even makes sense.

Computers fall in this latter category of ubiquitous technologies. In fact, from an analytical standpoint, computers are worse than that. Computers are representational artifacts, and the people who design them often start by constructing representations of the activities that are found in the sites where they will be used. This is the purpose of systems analysis, for example, and of the systematic mapping of conceptual entities and relationships in the early stages of database design. A computer, then, does not simply have an instrumental use in a given site of practice; the computer is frequently about that site in its very design. In this sense computing has been constituted as a kind of imperialism; it aims to reinvent virtually every other site of practice in its own image.

As a result, the institutional relationships between the computer world and the rest of the world can be tremendously complicated -- much more complicated than the relationships between the telephone world and telephone subscribers, or between the electric lighting world and the people who use electric lights in their workplaces and homes. The residents of these borderlands are many and varied, and increasingly so. They include the people who work on the border between the computer world and the medical world, whether because they conduct research in medical informatics or because they must encode their patient interactions for entry into an hospital's automated record keeping system. They likewise include the photographers whose livelihood is rapidly moving into

digital media, the engineers who must employ computer-based tools for design rationale capture, and the social scientists who study the place of computers in society. Each of the borderlands is a complicated place; everyone who resides in them is, at different times, both an object and an agent of technical representation, both a novice and an expert. Practitioners of participatory design (Greenbaum and Kyng 1991) and requirements engineering (Jirotka and Goguen 1994), among other disciplines, have done a great deal to explore and transform them. Above all, every resident of them is a translator between languages and worldviews: the formalisms of computing and the craft culture of the "application domain".

Every resident of the borderlands has a story, and in this chapter I would like to draw some lessons from my own. In 1988 I received a PhD in computer science at MIT, having conducted my dissertation research at the Artificial Intelligence Laboratory. I started out in school studying mathematics; I moved into computing because it helped me pay my school bills and because AI appealed to my adolescent sensibilities; I moved out of computing because I felt I had said everything I had to say through the medium of computer programs; and now I am a social scientist concerned with the social and political aspects of networking and computing. This path has its geographical aspects, of course, and its institutional aspects; at each transition I was able to construct myself as a certain sort of person, and I was usually able to stay employed. Here, though, I wish to focus primarily on the cognitive aspects of my path. My ability to move intellectually from AI to the social sciences -- that is, to stop thinking the way that AI people think, and to start thinking the way that social scientists think -- had a remarkably large and diverse set of historical conditions. AI has never had much of a reflexive critical practice, any more than any other technical field. Criticisms of the field, no matter how sophisticated and scholarly they might be, are certain to be met with the assertion that the author simply fails to understand a basic point. And so, even though I was convinced that the field was misguided and stuck, it took tremendous effort and good fortune to understand how and why. Along the way I spent several years attempting to reform the field by providing it with the critical methods it needed -- a critical technical practice.

In writing a personal narrative, I am assuming some risks. Few narratives of emergence from a technical worldview have been written; perhaps the best is Mike Hales' (1980) remarkable book Living Thinkwork about his time as a manufacturing engineer using operations research to design work processes for chemical production workers. A sociological inquiry is normally expected to have an explicit methodology. The very notion of methodology, however, supposes that the investigator started out with a clear critical consciousness and purpose, and the whole point of this chapter is that my own consciousness and purpose took form through a slow, painful, institutionally located, and historically specific process.

A personal narrative is also open to misinterpretation. I do not wish to engage in public psychotherapy; my emotional investments in AI and its research community are illuminating in their own way, but here I simply wish to recount na intellectual passage. I am not interested in portraying myself as an victim of circumstance or an innocent party in a conflict. I am not going to confess my sins, numerous though they have been, or seek absolution for them. Nor, as Patrick Sobalvarro usefully suggested in response to an early

draft of this chapter, would I wish to portray myself as Jesus among the Pharisees -- the virtuous hero who uncovers the corruption of traditional learning and yet fails to persuade the learned of their errors. Mine is not a tale of virtuous heroism, heaven knows, simply of the historical conditions of a path. Perhaps my tale will contribute to the emergence of a critical technical practice, but only if it is taken as a counsel of humility.

A final risk is that I may seem to condemn AI people as conspirators or fools. AI has a long history of conflict with critics, to whom it has often responded harshly. Although these responses may reflect the aggressive styles of particular personalities, they may also result from a lack of access to forms of historical explanation that interpretive social scientists and philosophers take for granted. Without the idea that ideologies and social structures can be reproduced through a myriad of unconscious mechanisms such as linguistic forms and bodily habits, all critical analysis may seem like accusations of conscious malfeasance. Even sociological descriptions that seem perfectly neutral to their authors can seem like personal insults to their subjects if they presuppose forms of social order that exist below the level of conscious strategy and choice.

.....

.....

The last few sections will describe my own experience and the lessons I have drawn from it. Section 5 will recount how I emerged from AI's unfortunately confining worldview and began to incorporate influences from philosophy, literary theory, and anthropology into my technical work. Section 6 will discuss what it means in practice to develop "alternatives" to an existing technical practice; for the most part, this notion is misleading. Section 7 will conclude with my own theory of critical engagement with a technical field.

.....

.....

A critical technical practice will, at least for the foreseeable future, require a split identity -- one foot planted in the craft work of design and the other foot planted in the reflexive work of critique. Successfully spanning these borderlands, bridging the disparate sites of practice that computer work brings uncomfortably together, will require a historical understanding of the institutions and methods of the field, and it will draw on this understanding as a resource in choosing problems, evaluating solutions, diagnosing difficulties, and motivating alternative proposals. More concretely, it will require a praxis of daily work: forms of language, career strategies, and social networks that support the exploration of alternative work practices that will inevitably seem strange to insiders and outsiders alike. This strangeness will not always be comfortable, but it will be productive nonetheless, both in the esoteric terms of the technical field itself and in the exoteric terms by which we ultimately evaluate a technical field's contribution to society.

.....

.....

Critical methods might be helpful in discovering other ways in which technical troubles can be inadvertently hidden from view. But nothing can substitute for the daily work of trying to get things built and working. Technical research can only develop from within the designer's own practical work, and it will only progress when the designer's

experience is neither channeled by self-reinforcing conceptual schemata from inside the field nor delegitimated by incommensurable philosophies from outside of it.