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MODES OF BEING: A LOGICAL, PSYCHOLOGICAL AND ONTOLOGICAL ANALYSIS OF CYBERSPACE

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ABSTRACT

The simulation of universes within the computer allows for modes of being that emulate and extended those of existing worlds as well as those which do not. None of these modes of being is particularly problematic for programmers or external observers of cyberspace. However, most discussions of cyberspace assume human interaction with it and its constructs, including social interaction within it. This raises the question of the capabilities of the human mind to cope with discrepancies in emulation, extensions to capabilities, and new modes of being. Most of these questions are very difficult to answer because we have inadequate understanding of current universes and our relations to them. However, the answers are part of design considerations for practical cyberspace and of the assessment of the potential impact of the large-scale realization of cyberspace. Part of the attraction of cyberspace research is that it encourages and facilitates greater understanding of ourselves, the universes about us, and actual and potential modes of being. This paper summarizes logical, psychological and ontological knowledge relevant to modes of being within cyberspace.

EXTENDED ABSTRACT

Gibson's construct of a pseudo-physical realm in correspondence to the data structures and processes of a large-scale computer network is realizable with existing technology. Indeed, anyone familiar with modern software engineering might well claim it already exists. The world of data, processes and communication flows within a computer network is real and generally visualizable to the system designer—such is the basis of our design knowledge and intuitions. However, Gibson goes one stage further in projecting the awareness of people within the construct in such a way that they can interact with it and one another. This is not within the current state-of-the-art. Our interfaces into the computer are still glimpses of a largely unlit universe viewed through narrow slits of distorting glass created by the interface designer. Gibson's vision is practically attractive as a major advance in human-computer interaction. However, even analyzed in such prosaic terms it poses problems that are beyond the cognitive ergonomics of our time, bound as it is to existing interface practice. If we treat cyberspace not as improved human-computer interaction but as access to new modes of being, then our existing frameworks for human-computer interaction have little to offer.

All these weaknesses become research strengths, however, if we use the concept and implementation of cyberspace to identify our existing ignorance, of ourselves, our universes and our constructs such as computers, and focus effort on increased understanding of these fundamental issues. Gibson's novels raise many of these issues and show how the fantasies of tommorrow's technologies can be connected to realities of current psychological and sociological dynamics. We can bring our existing scientific knowledge to bear on cyberspace, and analyze it in mathematical, logical, philosophical, psychological and anthropological terms. We can bring our existing technologies to bear on the creation of cyberspace, and analyze the resulting construct empirically to test the applicability of our existing theories and suggest new ones.

This paper contributes to the analysis of cyberspace in theoretical terms. It uses modal logics modeled through possible worlds to formulate statements and theories about cyberspace. It introduces the semantics of: space, time and causality as modes of physical being; of anticipation and convention as modes of pyschological and social being; and of coherence and rationality as modes of logical being. Structural criteria of connectedness, reflexivity, transitivity, reversibility and continuity are used to analyze existing physical and psycho-social worlds, our modeling of them, and feasible extensions. Examples are drawn from existing phenomena and literature to exemplify the abstractions.

It is interesting to note that many of the analytic tools used have been developed in recent years, are dependent for their application on computer tools, and are themselves influencing the future of computing. We seem at a nexus of human existence where the frontiers to new universes are being identified. Cyberspace has the potential to be the vehicle by which we explore them. To create it effectively requires a synthesis of virtually all our existing knowledge.