Chapter X

Computational AutoGnomics: An Introduction

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Abstract

This chapter presents an introductory survey regarding the AutoGnome, a semiotic machine based on ideas from the philosopher and semiotician C. S. Peirce. The theory behind the AutoGnome implicitly comprises a new method of integrated inquiry/inference/intuition which can be considered as a new theory of intelligence/mind suitable for a technological implementation within computers. These ideas also contribute to a better understanding of the nature of the mind and the requirements for the construction of a synthetic intelligence/mind. Besides Peirce, the theoretical background supporting the AutoGnome is a meta-theory of theory formation which we call “the form,” founded on relational systems theory and order theory. We start this chapter with a general discussion on current problems in artificial intelligence, followed by a theoretical introduction to the concept of “the form,” providing a formalization of “order” and its derivative calculus. At the end of the chapter, we report on a commercial application of the AutoGnome: the IntelliSite (an intelligent Web site) and its derivative implementations.
Introduction

Introductory Note

This chapter outlines the specification of some of the key notions of this theory of theory formation (the form) in a form which itself reflects the process. Thus, the “Introduction” section presents a review of the subject and its context and is followed by sections on “Foundations,” “Theory,” “Technology,” “Applications,” and “Research Organization,” the latter laying the groundwork for another adaptive iteration in the construction (evolution) of the form. Although this easily can be recognized as a general methodology, the fact that it is talking about itself, the theory of theory formation, and that it encompasses many different perspectives, voices, and styles argues that as an integrated conceptual structure, it does yield a completely new approach to intelligent systems development.

Digital Learning Systems

The 20th century saw the application of Boolean algebra (the algebra of logical statements) to the construction of computing machines that work by applying logical transformations to information contained in their memory. The development of information theory and the generalization of Boolean algebra to Bayesian inference have enabled these computing machines in the last quarter of the 20th century to be endowed with the ability to learn by making inferences from data, specifically as systems that are able to automatically recognize patterns. The networking of computers, in turn, led to Web sites of virtually unlimited data/information.

The Impasse in Developing Artificial Intelligence

For the last half of the last century, however, the course of development of artificial intelligence (AI) has waxed and waned cyclically following the predominating influence of the sentiment of the time as to whether humans should endeavor, if they can, to build a synthetic intelligence/synthetic mind. Many approaches to AI, such as automated neural nets, genetic algorithms, fuzzy logic, and fractal mathematical computational approaches, to identify only a few, have emerged. Yet AI has been an elusive goal to achieve by means of a systems architecture relying on an implementation based on the computer paradigm (input-storage/throughput-output system).

Nevertheless, pattern recognition techniques based largely on probabilistic methods have gained popularity in recent years among search engine specialists. Although probability largely was scoffed at a couple of decades ago, it is now considered to provide the most promising approach to AI. See, for example, the following.
The Role of a Modified Technology Acceptance Model in Explaining Internet Usage in Higher Education in Thailand
www.igi-global.com/article/role-modified-technology-acceptance-model/1381?camid=4v1a