بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
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To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

Cairo University
Faculty of Economics & Political Science
Department of Social-Science Computing

Complex Social Systems Paradigm:

A Literature Review on Concepts and Fields of Application

by

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Supervised by

Prof. Dr. Hazem A. Hosny

A Thesis Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Science in Social-Science Computing

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Title of thesis: Complex Social Systems Paradigm: A Literature Review on Concepts and Fields of Application

Summary:

The research is of a bibliographical and conceptual nature. An extensive literature review is conducted to draw some answers to questions that lie at the core of the social theorizing and modeling. This research attempts to introduce the basic building blocks of Social Complexity as a paradigm shift in social theories and the relevant fields of application. The research is inter-disciplinary as it transcends from social science, to philosophy, to computer science.

The first chapter focuses on the concept of paradigm shift and how Social Complexity changed the social science conduct in both theory and practice. Concepts such as emergence and self-organization are introduced. The micro-macro spectrum is reviewed with relevant to social theorizing, specifically under the work of Durkheim and Giddens.

Chapter 2 serves as a prologue to Agent-based Modeling (ABM). It focuses on the notions of simulation and modeling and how they progressed as heuristic tools for the study of social phenomena.

Chapter 3, as a pivotal section in the research, is basically a review of what contemporary theorists and practitioners of empirical social sciences have experienced with the rise of ABM. The concept of computation and complex systems at the Edge of Chaos is introduced. The origin of ABM in the field of artificial intelligence is then illustrated. Afterwards, the focus is shifted to the generative power of ABM and the building of artificial societies. Characteristics of agents and a general scheme of ABM design are then reviewed. The chapter concludes with a comparison of ABM as opposed to traditional analytical tools in the formalization of models in the social sciences.

The fourth and last chapter briefly introduces the various efforts of applying ABM concepts to the disparate social sciences. Prospects and challenges of the field are the concluding parts of the research.

Supervisor:

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Abstract:

An important characteristic of human societies is that they are a result of dynamic processes—a society emerges from constant changes yielded by a set of interactions among its individuals. Moreover, people in a society vary greatly in their capabilities, desires, needs and knowledge, in contrast to most physical systems that are composed of similar or identical units. As a result, traditional statistical models assuming universal rules governing the behavior of all components of a certain social organism fall short of describing and understanding the diverse and network complex behavior of that organism represented in the intricate non-linear relationships among its components (or so-called agents). Consequently, the perspective of human societies has dramatically shifted from viewing its dynamics as linear and deterministic to perceiving them as non-linear and 'complex'. In order to approach the structure of relationships in human societies, it is vital to use the appropriate tools that account for non-linear dynamics and emergence of new social orders. The Agent Based modeling (ABM) technique -among others- is an important computational tool for modeling social phenomena. The research is intended to explore the fundamental concepts of ABM, and how these concepts map to the nature of complex adaptive social systems.

Keywords:
Complex Adaptive Social Systems (CASS);
Emergence;
Social Simulation;
Edge of Chaos;
Agent-based Modeling (ABM).

Supervisor:
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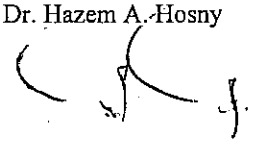

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I also wish to acknowledge the co-operation of the working staff in the Young Research Library, UCLA campus. Their utmost dedication to providing the highest quality service to library visitors and their commitment to serving any ad hoc needs, is one of the primary reasons I was able to gather the references needed to accomplish this research..

Last but not least, I owe thanks to my family who supported me wholeheartedly, and to my friend who helped in the editing and revision stages of the research writing.

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