

BOOK REVIEW

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Review of “The Model Thinker” by Scott Page



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Book details

Scott E. Page

The Model Thinker: What You Need to Know to Make Data Work for You.

Hatchett Book Group.

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Introduction

Modeling is a means of creating abstractions—of items and systems—either from the real-world, a perceived one, or even one’s imagination. Often, modeling helps develop representative simplified versions of a complex system with the aim of communication or education of a given audience (Epstein 2008).

While modeling has previously been applied to a wide range of domains and systems, of interest is the fact that models are extremely useful in the context of Complex Adaptive Systems (CAS) (Holland 1992). Models can range from Agent-based Models (Chaudhry 2016; Iantovics 2012) and Intelligent agents (Chira et al. 2012) to mathematical modeling, (Chaudhry et al. 2014) and complex social networks (Batool and Niazi 2014; Jin et al. 2013). Often times, advanced artificial intelligence techniques are also used for understanding CAS such as the use of swarms (Inbarani et al. 2014), ant methods (Pintea et al. 2011), and even fuzzy logic (Ramadan 2017) among other methods (Crişan et al. 2017).

“Model Thinker” by Page (2018) represents a single volume encompassing many facets of Complexity, Complex Adaptive Systems, and more. While we were hoping to present a review much earlier during the year, due to various reasons and also perhaps due to the wealth of information presented in the book, it has taken us a while to develop this review. Here, we hope to be able to present a review worthy of the book itself.

Book summary

The book represents the culmination of an effort by Prof. Page to solidify numerous ideas about modeling and simulation of complex systems—all in a single volume. While existing techniques have previously been presented such as in Gilbert (2019), Newman (2018), Mitchell (2009), Holland (2014), Holland (2000), Niazi and Hussain

(2012), somehow the depth and writing style used in this this particular book was certainly missing. The origin of the book is based on a course taught by the Professor first at Michigan, and then later, online at Coursera. The course has been a success. It has a massive following with up to a million students enrollments in recent offerings.

To build upon the words of the author, the book gives a vision of numerous angles, lenses, and perspectives to view the world. The focus is on 3 different classes of models. The first one being simplifications, followed by mathematical analogies, and exploratory, artificial constructs. In short, the book proposes the so-called “Many-model” approach.

The book starts with some background and history. And it then quickly moves on to justifications for employing modeling. The key emphasis is that by looking at other models, one gets to know techniques which can then be used to develop models of one’s very own. However, the author clarifies the paradox of modeling in terms of—models needing to be simplified, stripped down versions of reality to be useful and then not being able to cover every aspect in their entirety—just on their own—hence the many model approach.

In terms of book structure, the second and third chapters motivate the many-model approach further. This is followed by a set of challenges about modeling humans. The next twenty-something chapters simply outline different models and associated classes. The book concludes by applying the many-model approach to two seemingly very different problems—namely the “Opioid Epidemic” and “income inequality”.

Book review

Intended audience

The primary audience of this book is multidisciplinary researchers which are new to the theory of modeling and simulation of complex systems. In this respect, the book serves its purpose well.

What new information is presented?

The book presents a wealth of information gradually introducing the reader to the theory and moving on to the practice of modeling and simulation of complex systems.

Is there anything missing?

The book presents a lot of interesting ideas and concepts. However, it is not and does not aim to be exhaustive. That, however, would actually be a plus point. Consider the fact that already 20 or so modeling classes have been introduced in this book. So, interested reader can simply delve into related work moving on from here.

Any further suggestions

Ideally, it would have really helped if the many-model approach could have been flattened in the form of a Unified framework for modeling. In some respects, it appears to Russell and Norvig’s book “Artificial Intelligence, a Modern Approach” (Russell and Norvig 2016) except that the focus of the Norvig book is on agents. So, it would have been nice if the approach would have been simplified in a Unified framework.

Why read it?

This book is a must-read for anyone interested in modeling, simulation, or Complexity in general. The audience ranges from Social scientists to Engineers and even Medical professionals. The reason for that is the book offers insights on how to think. And that too, not just in a single way.

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Authors' contributions

MN conceived the idea. All authors read, co-wrote, edited the final manuscript. All authors read and approved the final manuscript.

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