

## BOOK REVIEW

# Theory, Transformation, Practice and Exploration —A Review of An Introduction to Computational Advertising

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### Abstract

This review offers a critical examination of *An Introduction to Computational Advertising* (in Chinese 计算广告学概论), edited in 2024 by Duan Chunlin, which presents a foundational framework for the emerging discipline of computational advertising in the era of data intelligence. Organised into four sections—Theory, Transformation, Practice and Exploration—the book systematically constructs the conceptual boundaries of computational advertising, explains its algorithmic and technological infrastructure, and situates it within contemporary digital ecosystems shaped by platform mechanisms and human-machine collaboration. It provides valuable insights into user targeting, programmatic creativity, value optimisation and effect measurement, while also addressing frontier topics such as intelligent brand communication, metaverse media and algorithmic governance. This review evaluates the book's contributions to disciplinary development, highlights its strengths in theoretical integration and contextual analysis, and identifies limitations related to empirical validation and international applicability. It concludes by suggesting directions for future research, including algorithmic fairness, model interpretability and interdisciplinary dialogue. This review highlights the contributions of the book to the field of computational advertising and its potential to inspire future scholarship and practice.

### KEYWORDS

Computational advertising, Digital advertising ecosystem, Algorithmic decision-making, Human-machine collaboration, Platform economy, Value networks, Algorithmic governance.

Computational advertising has ushered in a novel paradigm for advertising practice grounded in data, algorithms and artificial intelligence (Wei 2024). This emergent paradigm discards, reconfigures and augments classical advertising theories and marketing models; the analytical mind-set and methods of big data progressively enhance the objectivity and scientific basis of advertising activities (Araujo et al. 2020). For instance, some research uses computational models to assess consumer attitudes and thereby improves the rigour of advertising decision making through data-driven approaches (Wu et al. 2023). *An Introduction to Computational Advertising*, edited by Professor Duan Chunlin and published by East China Normal University Press in 2024, offers a systematic framework for research and teaching in computational advertising in an

era of deep integration between artificial intelligence and advertising communication. The volume not only reviews the field's historical development, technical principles and business models, but also integrates relevant case studies to illuminate the transformation of advertising in data-driven and intelligent contexts. It balances the needs of industry and academia: it is simultaneously a textbook and a research oriented monograph that connects scholarship with practice.

The book is organised into four sections: a theoretical segment, a transformation segment, a practical segment and an exploratory segment. The theoretical section (Chapters 1–3) principally examines the essence and characteristics of computational advertising, its reconstruction of the disciplinary architecture of advertising, and the computational foundations of the field. Chapter 1 gives a clear conceptual delineation of “computational advertising” and underscores its tripartite attributes: data-driven processes, algorithmic orchestration and human-machine collaborative decision making. Chapter 2 explores,

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from a disciplinary building perspective, how computational advertising advances a paradigm shift in advertising studies; it proposes that the research object has expanded from the “communication process” to a triadic system of “user behaviour–platform mechanisms–commercial decision making,” consistent with scholars’ calls to broaden the scope of advertising research Helberger et al. (2020). Chapter 3 further introduces bounded and approximate computation, visual computing, cognitive modelling and explainable algorithms as theoretical building blocks that lay the foundation for a knowledge methodology system in computational advertising. The significance of this section lies in its departure from the traditional linear logic of “creativity–media–effects.” By emphasising the methodological status of algorithms in the allocation of advertising resources, it points towards the construction of a computational theoretical framework for the discipline.

The transformation section (Chapters 4–6) offers an in-depth discussion of relevant technologies in computational advertising and of the evolution of the digital advertising ecosystem and its actors, revealing the internal operating mechanisms of this ecosystem. It analyses the theoretical framework within the dynamic context of technology and ecosystems. Chapter 4 meticulously explains core technologies such as user targeting, auction-based advertising and the intelligent generation of creative content, providing readers with a clear route to understanding the technology driven essence of computational advertising. Chapters 5 and 6 make substantive contextual contributions by using symbiosis theory to analyse the symbiotic units, patterns and environments in the digital advertising ecosystem, treating it as a complex symbiotic system (Duan and Cui 2024). This perspective furnishes a powerful, non-linear analytical tool for the management field to analyse competition and cooperation, shifts in power structures and organisational change in platform economies. Moreover, this view echoes recent research emphasising that platform-based ecosystems operate as dynamic value networks in which interdependence, resource complementarities and knowledge exchange shape organisational performance (Lissillour et al. 2024). It reveals the interdependence of actors and internal mechanisms in complex digital environments and offers direct inspiration for research in strategic management and organisational behaviour.

The practical section (Chapters 7–10) investigates the value creation, content production, user interaction, placement and measurement of effects in computational advertising, and examines how such advertising maximises the matching of user needs. By using more precise targeting, computational advertising improves the efficiency of resource allocation to maximise the return on investment for advertisers (Huh and Malthouse 2020). Moving from macro level theory to micro level operations, this section clearly outlines a complete loop from value creation (fulfilling user needs), content production (programmatic creativity), user interaction (participatory culture) to effect measurement (integration of brand building and performance). It successfully integrates the preceding theory and technology with commercial practice; through case analysis, it explains how data oriented thinking concretely

guides advertising activities, and thus offers high reference value for practitioners.

The exploratory section (Chapters 11–14) conducts a detailed analysis of future trends in computational advertising, offering deep discussion and forward-looking prediction. It reflects the editor’s anticipatory vision by situating computational advertising in cutting edge contexts such as intelligent brand communication, the holographic internet and the metaverse, and by paying attention to key issues including algorithmic ethics (Lissillour and Monod 2024, Monod 2025), regulatory governance (Sahut et al. 2023b) and talent development (Chapuis and Guégan 2024).

Nevertheless, the book also exhibits certain limitations. Its approach to computational advertising research is heavily theory oriented, and empirical support remains inadequate. As a foundational work, it presents macro level discussion of technological applications, ecosystem mechanisms and disciplinary structure, but lacks systematic model testing and data validation. Future research could adopt integrated paradigms that combine computational advertising with experimental methods, using pretest–intervention–posttest designs or online field experiments to directly examine the causal chain between algorithmic strategies and user outcomes (Thomas and Liu-Thompkins 2024). In addition, the book needs a more specific approach to handling algorithmic bias and fairness: recent frameworks indicate that bias identification and accountability mechanisms (Sahut et al. 2023a) should be embedded at the levels of data, models and platform mechanisms to avoid amplifying existing inequalities in granular targeting and to enhance the interpretability and compliance of computational advertising (Akter et al. 2022). Furthermore, since the cases and theories cited in the volume are mainly drawn from the context of China’s digital advertising market, highlighting the indigenous practices (Rodriguez-Escobar 2024) of China’s platform ecosystem and technologies, the lack of broader international comparison may constrain its global applicability.

## AUTHOR CONTRIBUTIONS

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None reported.

## CONFLICT OF INTEREST

The authors declare no potential conflict of interests.

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