

# Elements Parametric Design Robert Woodbury

Elements of Parametric Design Smart Graphics The Politics of Parametricism Computational Design Modeling Inside Smartgeometry Transportation Computational Design The Evolution of Computation in Architecture Smart Graphics Parametric Design for Architecture Mathematical Reviews AA Files Engineering Design and Design for Manufacturing Operations Research Digital Design Studios Intelligent Systems in Design and Manufacturing Communication Satellite Systems Technology; Bulletin of the Operations Research Society of America Chain Store Age The Technology Teacher Robert Francis Woodbury Andreas Butz Matthew Poole Christoph Gengnagel Terri Peters S. K. Punwani Rongrong Yu Michael Fox Wassim Jabi John R. Dixon Thomas Seeböhm Richard Barry Marsten

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pushed by practices wanting to produce novelty computer aided design systems are increasingly parametric they represent designs that change with their input data such systems give more control and capability to designers but require much more comprehensive understanding to be used effectively this book teaches what new knowledge and skills designers need in order to

master the parametric and how they can learn and use them

the international symposium on smart graphics 2005 was held from august 22 24 2005 in the cloister frauenworth on the island of frauenchiemsee germany

over the last decade parametricism has been heralded as a new avant garde in the industries of architecture urban design and industrial design regarded by many as the next grand style in the history of architecture heir to postmodernism and deconstruction from buildings to cities the built environment is increasingly addressed designed and constructed using digital software based on parametric scripting platforms which claim to be able to process complex physical and social modelling alike as more and more digital tools are developed into an apparently infinite repertoire of socio technical functions critical questions concerning these cultural and technological shifts are often eclipsed by the seductive aesthetic and the alluring futuristic imaginary that parametric design tools and their architectural products and discourses represent the politics of parametricism addresses these issues offering a collection of new essays written by leading international thinkers in the fields of digital design architecture theory and technology exploring the social political ethical and philosophical issues at stake in the history practice and processes of parametric architecture and urbanism each chapter provides different vantage points to interrogate the challenges and opportunities presented by this latest mode of technological production

this book publishes the peer reviewed proceeding of the third design modeling symposium berlin the conference constitutes a platform for dialogue on experimental practice and research within the field of computationally informed architectural design more than 60 leading experts the computational processes within the field of computationally informed architectural design to develop a broader and less exotic building practice that bears more subtle but powerful traces of the complex tool set and approaches we have developed and studied over recent years the outcome are new strategies for a reasonable and innovative implementation of digital potential in truly innovative and radical design guided by both responsibility towards processes and the consequences they initiate

smartgeometry sg is a key influence on the architectural community who explore creative computational methods for the design of buildings an informal international network of practitioners and researchers the group meets annually to experiment with new technologies and collaborate to develop digital design techniques when sg was founded in 2001 by london based architects and friends hugh whitehead foster partners j parrish aecom and lars hesselgren plp there was little in the way of parametric tools for architecture sg was founded to encourage the development discussion and experimentation of digital design techniques driven by design intent rather than on construction specifications sg calls for a re consideration of the design process where the creation of computational mechanisms become an integral part of designing not a task done prior to or separate from the process in the early years of the workshops this need for new ways of design thinking led to the development of bentley s generativecomponents software in recent years the ecology of these design environments has diversified to include multiple software platforms as well as innovative fabrication techniques and interactive environments sg has grown accordingly from a handful of experts to an international network of designers who are defining the future of design founded by digital pioneers it creates the algorithmic designers of the future inside smartgeometry can be seen as a retroactive manifesto for sg examining and contextualising the work of the sg community the digital spaces prototypes and buildings designed using bespoke tools created in response to architectural ideas from interactive crowd sourcing tools to responsive agent based systems to complex digitally fabricated structures it explores more than a decade of advances that have been influential for architecture through 23 original texts including reflections by the founders and key contributors such as robert aish martin bechthold mark burry chris williams and robert woodbury the book offers a critical state of the art of computational design for architecture many international design and engineering firms have participated in sg and the book includes chapters by practitioners from offices such as case design2production foster partners grimshaw populous and som

new computational design tools have evolved rapidly and been increasingly applied in the field of design in recent years complimenting and even replacing the traditional design media and approaches design as both the process and product are changing due to the emergence and adoption of these new technologies understanding and assessing the impact of these new computational design environments on design and designers is important for advancing design in the contemporary context do

these new computational environments support or hinder design creativity how do those tools facilitate designers thinking such knowledge is also important for the future development of design technologies research shows that design is never a mysterious non understandable process for example one general view is that design process shares a common analysis synthesis evaluation model during which designers interact between design problem and solution spaces understanding designers thinking in different environments is the key to design research education and practice this book focuses on emerging computational design environments whose impact on design and designers have not been comprehensively and systematically studied it comprises three parts the history and recent developments of computational design technologies are introduced in part i the main categories of technologies cover from computer aided drafting and modelling tools to visual programming and scripting tools for algorithmic design to advanced interfaces and platforms for interactions between designers between designers and computers and between the virtual environment and the physical reality to critically explore design thinking especially in these new computational design environments formal approaches to studying design thinking and design cognition are introduced and compared in part ii drawing on literature and studies from the 70s to the current era part iii concludes the book by exploring the impact of different computational design technologies on design and designers using a series of case studies conducted by the author team building on their close collaboration over the past five years the book offers new insights into designers thinking in the rapidly evolving computational design environments which have not been critically and systematically studied and reported in the current literature the book is meant for design researchers educators and students professional practitioners and consultants as well as people who are interested in computational design in general

this book is the first comprehensive overview of the pioneering works events and people that contributed to the paradigm shift defined by computation in architecture only recently has computation fostered profound new ways of designing fabricating constructing and thinking about architecture while the profession sits at the end of the beginning of this historically transformative shift it is now possible to look back upon the rapidly maturing landscape of projects influencers and tools that have finally begun to catch up with the visionary thinking of the past readers are guided through the fascinating and fast paced historical timeline of the development of computation in architecture beginning with an account of the pioneering futuristic

thinkers the authors then guide the reader through the birth of computation the appropriation of tools and the impact of experimentation on the profession leading into the legitimacy of research and how paradigms have been expanded the examples and influences are presented in a way that they can be understood and built upon this book is a must read for students of computation in architecture as well as researchers and practicing architects thinking about how the tools we use and the ways we design our buildings and environments with them can truly impact our lives

architects use computer aided tools to help them visualize their ideas and build models of their designs however the majority of these models are built in such a way that it makes them difficult to modify interactively parametric design software addresses this problem by allowing architects to specify relationships among various parameters of their design model the advantage is that a designer can then change a few parameters and the remainder of the model will react and update accordingly and in a consistent manner based on the pre set associative rules through a detailed description of various parametric generative and algorithmic techniques this book provides a practical guide to generating geometric and topological solutions for various situations including explicit step by step tutorials that will enable the reader to understand both general concepts and specific computational algorithms while the techniques and algorithms can be generalized to suit to any parametric environment the book illustrates its concepts using the scripting languages of one of the most powerful 3d visualization and animation design software systems autodesk 3ds max maxscript one of the most popular open source java based scripting environments processing and a brand new language specifically tailored for parametric and generative design autodesk designscrip this clear accessible book will have a wide appeal to students who would like to experiment more with parametric techniques but lack the skills and knowledge to do so includes a foreword by robert woodbury and an afterword by brian johnson

covers all aspects of or including computing and decision technology environment energy and natural resources financial services logistics and supply chain operations manufacturing operations optimization public and military services simulation stochastic models telecommunications and transportation

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