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Architecture Research Building Springer

High Value Manufacturing is the result of the 6th International Conference on Advanced Research in Virtual and Rapid Prototyping, held in Leiria, Portugal, October 2013. It contains current contributions to the field of virtual and rapid prototyping (V&RP) and is also focused on promoting better links between industry and academia. This volume comprises a collection of more than 110 reviewed papers which cover a wide range of topics, such as Additive and Nano Manufacturing Technologies, Biomanufacturing, Materials, Rapid Tooling and Manufacturing, CAD and 3D Data Acquisition Technologies, Simulation and Virtual Environments, and novel applications. High Value Manufacturing is intended for engineers, designers and manufacturers who are active in the fields of mechanical, industrial and biomedical engineering.

Lineament: Material, Representation and the Physical Figure in Architectural Production Springer

This book provides an overview of the environmental problems that arise from construction activity, focusing on refurbishment as an alternative to the current crisis in the construction sector, as well as on measures designed to minimize the effects on the environment. Furthermore, it offers professionals insights into alternative eco-efficient solutions using new materials to minimize environmental impacts and offers solutions that they can incorporate into their own designs and buildings. It also demonstrates best practices in the cooperation between various universities in Andalusia in Spain and Latin America and many public and private companies and organizations. This book serves as a valuable reference resource for professionals and researchers and provides an overview on the status of investigations to find solutions to improve sustainable development in terms of materials, systems, facilities, neighborhoods, buildings, and awareness of the society involved.

Rethinking Design and Construction IGI Global

This book highlights the concept of informed architecture as an alternative to performance-based approaches. Starting with an analysis of the state of art, the book defines an operative

methodology in which performative parameters lead to the generation of the shape becoming the design's input, rather than being mere quantitative parameters. It then uses case studies to investigate the methodology. Lastly, the book discusses a novel way of conceiving and using the manufacturing tool, which is the basis for the definition of informed architectures in relation to data usage and the optimization process.

High Value Manufacturing: Advanced Research in Virtual and Rapid Prototyping Birkhäuser
Design of Integrally-Attached Timber Plate Structures outlines a new design methodology for digitally fabricated spatial timber plate structures, presented with examples from recent construction projects. It proposes an innovative and sustainable design methodology, algorithmic geometry processing, structural optimization, and digital fabrication; technology transfer and construction are formulated and widely discussed. The methodology relies on integral mechanical attachment whereby the connection between timber plates is established solely through geometric manipulation, without additional connectors, such as nails, screws, dowels, adhesives, or welding. The transdisciplinary design framework for spatial timber plate structures brings together digital

architecture, computer science, and structural engineering, covering parametric modeling and architectural computational design, geometry exploration, the digital fabrication assembly of engineered timber panels, numerical simulations, mechanical characterization, design optimization, and performance improvement. The method is demonstrated through different prototypes, physical models, and three build examples, focusing specifically on the design of the timber-plate roof structure of 23 large span arches called the Annen Headquarters in Luxembourg. This is useful for the architecture, engineering, and construction (AEC) sector and shows how new structural optimization processes can be reinvented through geometrical adaptations to control global and local geometries of complex structures. This text is ideal for structural engineering professionals and architects in both industry and academia, and construction companies.

[Archimats](#) Springer

Structures and Architecture – Bridging the Gap and Crossing Borders contains the lectures and papers presented at the Fourth International Conference on Structures and Architecture (ICSA2019) that was held in Lisbon, Portugal, in July 2019. It also contains a multimedia device with the full texts of the lectures presented at the conference, including the 5 keynote lectures, and almost 150 selected contributions. The contributions on creative and scientific aspects in the conception and construction of structures, on advanced technologies and on complex architectural and structural applications represent a fine blend of scientific, technical and practical novelties in both fields. ICSA2019 covered all major aspects of structures and architecture, including: building envelopes/façades; comprehension of complex forms; computer and experimental methods; futuristic structures; concrete and masonry structures; educating architects and structural engineers; emerging technologies; glass structures; innovative architectural and structural design; lightweight and membrane structures; special structures; steel and composite structures; structural design challenges; tall buildings; the borderline between architecture and structural engineering; the history of the relationship between architects and structural engineers; the tectonic of architectural solutions; the use of new materials; timber structures, among others. This set of book and multimedia device is intended for a global readership of researchers and practitioners, including architects, structural and construction engineers, builders and building consultants, constructors, material suppliers and product manufacturers, and other professionals involved in the design and realization of architectural, structural and infrastructural projects.

[Cross-Disciplinary Collaboration](#) Routledge

Material Synthesis: Fusing the Physical and the Computational Guest-edited by Achim Menges A new understanding of the material in architecture is fast emerging. Designers are no longer conceiving of the digital realm as separate from the physical world. Instead computation is being regarded as the key interface for material exploration and vice versa. This represents a significant perceptual shift in which the materiality of architecture is no longer seen to be a fixed property and passive receptor of form, but is transformed into an active generator of design and an adaptive agent of architectural performance. In stark contrast to previous linear and mechanistic modes of fabrication and construction, materialisation is now beginning to coexist with design as explorative robotic processes. This represents a radical departure from both the trite modernist emphasis on 'truth to materials' and the dismissal of materials by the previous generation of digital architects. The issue features designers, researchers and thinkers that are at the forefront of exploring new modes of material enquiry and its deep interrelationship with technology, biology and culture. Through their work, which unfolds from multifaceted alliances between the fields of design, engineering and natural sciences, it seeks to trace the emergence of a novel material culture in architecture. Architectural and engineering contributors include: Sean Ahlquist, Martin Bechthold, Philippe Block, Karola Dierichs, Jan Knippers, Achim Menges, Neri Oxman, Steffen Reichert and Tobias Schwinn. Scientific and philosophical perspectives provided by: Mario Carpo, Manuel De Landa, Neil Gershenfeld and Thomas Speck. Features the design research of: Harvard's Material Processes and Systems Group, MIT's Mediated Matter Group and Stuttgart University's Institute for Computational Design.

[Material Synthesis](#) Routledge

Over the past decades we witnessed a tremendous shift in the principles of architectural design based on the advancement of computer aided design and manufacturing. Computation in architecture came with a whole new set of techniques as well as theories that did change the way we build and design today. This research investigates ways to embed computational simulation and optimisation into architectural design processes at an early, conceptual stage. Simulation and optimization are not seen as a post-design strategy to improve performance aspects of a well-

developed design, but rather as design strategies in their own rights. Therefore, design approaches employing simulation and optimization were developed, tested and discussed. Conditions and prerequisites for successfully embedding simulation and optimization into architectural design processes were formulated and benefits were derived. Design approaches that use digital simulation and optimization are characterised by not favouring rational form finding above intuitive form making, or vice versa – they rather support informed design decisions. Therefore, Informed Form Generation is established as a design approach within this thesis. It is not one specific, universally applicable process, but rather comprises a category of approaches and constitutes an attitude.

[Computer Vision – ECCV 2018](#) Springer

Nature has provided opportunities for scientists to observe patterns in biomaterials which can be imitated when designing construction materials. Materials designed with natural elements can be robust and environment friendly at the same time. Advances in our understanding of biology and materials science coupled with the extensive observation of nature have stimulated the search for better accommodation/compression of materials and the higher organization/reduction of mechanical stress in man-made structures. Bio-Inspired Materials is a collection of topics that explore frontiers in 3 sections of bio-inspired design: (i) bionics design, (ii) bio-inspired construction, and (iii) bio-materials. Chapters in each section address the most recent advances in our knowledge about the desired and expected relationship between humans and nature and its use in bio-inspired buildings. Readers will also be introduced to new concepts relevant to bionics, biomimicry, and biomimetics. Section (i) presents research concepts based on information gained from the direct observation of nature and its applications for human living. Section (ii) is devoted to 'artificial construction' of the Earth. This section addresses issues on geopolymers, materials that resemble the structure of soils and natural rocks; procedures that reduce damage caused by earthquakes in natural construction, the development of products from vegetable resins and construction principles using bamboo. The last section takes a look into the future towards the improvement of human living conditions. Bio-Inspired Materials offers readers - having a background in architecture, civil engineering and systems biology - a new perspective about sustainable building which is a key part of addressing the environmental concerns of current times.

[Exploring Informed Architecture](#) Springer Nature

This book deals with a group of architected materials. These are hybrid materials in which the constituents (even strongly dissimilar ones) are combined in a given topology and geometry to provide otherwise conflicting properties. The hybridization presented in the book occurs at various levels - from the molecular to the macroscopic (say, sub-centimeter) ones. This monograph represents a collection of programmatic chapters, defining archimats and summarizing the results obtained by using the geometry-inspired materials design. The area of architected or geometry-inspired materials has reached a certain level of maturity and visibility for a comprehensive presentation in book form. It is written by a group of authors who are active researchers working on various aspects of architected materials. Through its 14 chapters, the book provides definitions and descriptions of the archetypes of architected materials and addresses the various techniques in which they can be designed, optimized, and manufactured. It covers a broad realm of archimats, from the ones occurring in nature to those that have been engineered, and discusses a range of their possible applications. The book provides inspiring and scientifically profound, yet entertaining, reading for the materials science community and beyond.

[Innovative Techniques of Representation in Architectural Design](#) Springer Nature

Visual computing and descriptive geometry are multidisciplinary fields addressing the handling of images, 3D models, and other computer graphics. These ideas are experiencing a revival due to emergent technologies and applications available to developers. Based in traditional forms of design and architecture, these fields are currently experiencing a bounty of new research based on old principles. The Handbook of Research on Visual Computing and Emerging Geometrical Design Tools seeks to add to this knowledge base by considering these technologies from a designer's perspective rather than reiterating the principles of computer science. It combines aspects of geometry and representation with emerging tools for CAD, generation, and visualization while addressing the digital heritage of such fields. This book is an invaluable resource for developers, students of both graphic and computer-generated design, researchers, and designers.

[Advanced Timber Structures](#) MDPI

This volume explores the mathematical character of architectural practice in diverse pre- and early modern contexts. It takes an explicitly interdisciplinary approach, which unites scholarship in early

modern architecture with recent work in the history of science, in particular, on the role of practice in the "scientific revolution". As a contribution to architectural history, the volume contextualizes design and construction in terms of contemporary mathematical knowledge, attendant forms of mathematical practice, and relevant social distinctions between the mathematical professions. As a contribution to the history of science, the volume presents a series of micro-historical studies that highlight issues of process, materiality, and knowledge production in specific, situated, practical contexts. Our approach sees the designer's studio, the stone-yard, the drawing floor, and construction site not merely as places where the architectural object takes shape, but where mathematical knowledge itself is deployed, exchanged, and amplified among various participants in the building process.

[10th International Conference, DHM 2019, Held as Part of the 21st HCI International Conference, HCII 2019, Orlando, FL, USA, July 26-31, 2019, Proceedings, Part I](#) Springer

This book contains 24 technical papers presented at the fourth edition of the Advances in Architectural Geometry conference, AAG 2014, held in London, England, September 2014. It offers engineers, mathematicians, designers, and contractors insight into the efficient design, analysis, and manufacture of complex shapes, which will help open up new horizons for architecture. The book examines geometric aspects involved in architectural design, ranging from initial conception to final fabrication. It focuses on four key topics: applied geometry, architecture, computational design, and also practice in the form of case studies. In addition, the book also features algorithms, proposed implementation, experimental results, and illustrations. Overall, the book presents both theoretical and practical work linked to new geometrical developments in architecture. It gathers the diverse components of the contemporary architectural tendencies that push the building envelope towards free form in order to respond to multiple current design challenges. With its introduction of novel computational algorithms and tools, this book will prove an ideal resource to both newcomers to the field as well as advanced practitioners.

[Bio-Inspired Materials](#) IGI Global

This book is an exciting collection of research articles that offer a unique view into the fast developing field of metal additive manufacturing, providing insights into this advanced manufacturing technology. The articles span recent advances in metal AM technologies, and their application to a wide range of metals, exploring how the processing parameters offer unique material properties. This book encapsulates the state of the art in this rapidly evolving field of technology and will be a valuable resource for researchers in the field, from Ph.D. students to professors, and through to industrial end users.

[Additive Manufacturing of Metals](#) UCL Press

Through expanded intelligence, the use of robotics has fundamentally transformed a variety of fields, including manufacturing, aerospace, medicine, social services, and agriculture. Continued research on robotic design is critical to solving various dynamic obstacles individuals, enterprises, and humanity at large face on a daily basis. *Robotic Systems: Concepts, Methodologies, Tools, and Applications* is a vital reference source that delves into the current issues, methodologies, and trends relating to advanced robotic technology in the modern world. Highlighting a range of topics such as mechatronics, cybernetics, and human-computer interaction, this multi-volume book is ideally designed for robotics engineers, mechanical engineers, robotics technicians, operators, software engineers, designers, programmers, industry professionals, researchers, students, academicians, and computer practitioners seeking current research on developing innovative ideas for intelligent and autonomous robotics systems.

[Architectural Draughtsmanship](#) Springer

Bringing together pioneers in design and making within architecture, construction, engineering, manufacturing, materials technology and computation, *Fabricate* is a triennial international conference, now in its third year (ICD, University of Stuttgart, April 2017). The 2017 edition features 32 illustrated articles on built projects and works in progress from academia and practice, including contributions from leading practices such as Foster + Partners, Zaha Hadid Architects, Arup, and Ron Arad, and from world-renowned institutions including ICD Stuttgart, Harvard, Yale, MIT, Princeton University, The Bartlett School of Architecture (UCL) and the Architectural Association. Each year it produces a supporting publication, to date the only one of its kind specialising in Digital Fabrication.

[GEOMETRIAS 2017, Coimbra, Portugal, June 16-18](#) Birkhäuser

In light of environmental challenges architecture is facing, wood is no longer regarded as outmoded, nostalgic, and rooted in the past, but increasingly recognized as one of the most

promising building materials for the future. Recent years have seen unprecedented innovation of new technologies for advancing wood architecture. *Advancing Wood Architecture* offers a comprehensive overview of the new architectural possibilities that are enabled by cutting-edge computational technologies in wood construction. It provides both an overarching architectural understanding and in-depth technological information through built projects and the works of four leading design research groups in Europe. The projects presented include large scale, permanent buildings such as the ETH Arch-Tec Lab Building in Zurich, the Landesgartenschau Exhibition Hall near Stuttgart and the Boiler House in Hooke Park, UK, as well as, built research prototypes investigating additive robotic fabrication, folded plate structures and meteorosensitive building skins. Illustrated in full colour, the book showcases the latest technological developments in design computation, simulation and digital fabrication together with an architectural, engineering and manufacturing perspective, offering an outlook towards novel spatial and constructional opportunities of a material with unrivalled ecological virtues.

Geometrical Objects Springer

This book connects the different topics and professions involved in information technology approaches to architectural design, ranging from computer-aided design, building information modeling and programming to simulation, digital representation, augmented and virtual reality, digital fabrication and physical computation. The contributions include experts' academic and practical experiences and findings in research and advanced applications, covering the fields of architecture, engineering, design and mathematics. What are the conditions, constraints and

opportunities of this digital revolution for architecture? How do processes change and influence the result? What does it mean for the collaboration and roles of the partners involved. And last but not least: how does academia reflect and shape this development and what does the future hold? Following the sequence of architectural production - from design to fabrication and construction up to the operation of buildings - the book discusses the impact of computational methods and technologies and its consequences for the education of future architects and designers. It offers detailed insights into the processes involved and considers them in the context of our technical, historical, social and cultural environment. Intended mainly for academic researchers, the book is also of interest to master's level students.

Robotic Fabrication in Architecture, Art and Design 2018 Bentham Science Publishers

This comprehensive catalogue of contemporary work examines the renewed investment in the relationship between representation, materiality, and architecture. It assembles a range of diverse voices across various institutions, practices, generations, and geographies, through specific case studies that collectively present a broader theoretical intention.

Proceedings of the Fourth International Conference on Structures and Architecture (ICSA 2019), July 24-26, 2019, Lisbon, Portugal Springer

Workflows are being rethought and remodelled across the architecture, engineering and construction (AEC) spectrum. The synthesis of building information modelling (BIM) platforms with digital simulation techniques and increasing access to data, charting building performance, is

allowing architects to engage in the generation of new workflows across multidisciplinary teams. By merging digital design operations with construction activities, project delivery and post-occupation scenarios, architects are becoming instrumental in the shaping of buildings as well as the design process. Workflows expand the territory of architectural practice by extending designers' remit beyond the confines of the design stage. The implications for the AEC industry and architecture as a profession could not be greater. These new collaborative models are becoming as important as the novel buildings they allow us to produce. Contributors include: Shajay Bhooshan, John Cays, Randy Deutsch, Sean Gallagher, Ian Keough, Peter Kis, Jonathan Mallie, Adam Modesitt, Rhett Russo, Dale Sinclair, and Stacie Wong. Featured architects: Arup, Diller Scofidio + Renfro, GLUCK+, GRO Architects, PLANT, Populous, Young & Ayata, and Zaha Hadid Architects.

Parametric Geometry of Curves and Surfaces Springer

How can the fundamental digital change taking place in design and construction be actively used to bring about cultural change in architecture? By exploring robotic production methods and innovative material developments, Achim Menges and Jan Knippers have succeeded in developing genuine digital building systems that combine architectural elegance with effective construction. The book provides an insight into ten years of joint research at the ICD and ITKE Institutes of Stuttgart University. Taking completed pavilions and buildings as examples, the authors demonstrate the viability of the underlying hypotheses that impressively push the limits of construction. Articles from international experts contribute to the current debate on architecture.

Best Sellers - Books :

- [The Democrat Party Hates America](#)
- [Regretting You By Colleen Hoover](#)
- [The Light We Carry: Overcoming In Uncertain Times By Michelle Obama](#)
- [The Summer Of Broken Rules](#)
- [Oh, The Places You'll Go! By Dr. Seuss](#)
- [Think And Grow Rich: The Landmark Bestseller Now Revised And Updated For The 21st Century \(think And Grow Rich Series\)](#)
- [The Subtle Art Of Not Giving A F*ck: A Counterintuitive Approach To Living A Good Life By Mark Manson](#)
- [I Love You Like No Otter: A Funny And Sweet Board Book For Babies And Toddlers \(punderland\) By Rose Rossner](#)
- [How To Catch A Leprechaun](#)
- [The Covenant Of Water \(oprah's Book Club\) By Abraham Verghese](#)