

Digital Fabrication

The publication "Fold, Unfold : Deployable Structures and Digital Fabrication" is the documentation of the workshop of the same name hosted at TU-Berlin from february till march 2017 in collaboration with ETSAE Cartagena. The main objective of this seminar was to design and build different prototypes of deployable structures that can colonize a space to be inhabited temporarily. Die Publikation „Fold, Unfold : Deployable Structures und Digital Fabrication" dokumentiert den gleichnamigen Workshop, der von Februar bis März 2017 an der TU Berlin in Zusammenarbeit mit der ETSAE Cartagena stattgefunden hat. Besonderes Ziell des Seminars war es, entfaltbare Strukturen zu entwerfen und zu bauen, die Räume einnehmen können und diese vielfältig und temporär nutzbar machen.

Reflecting the R&D efforts in the field that have resulted in a plethora of novel applications over the past decade, this handbook gives a comprehensive overview of the tangible benefits of nanotechnology in catalysis. By bridging fundamental research and industrial development, it provides a unique perspective on this scientifically and economically important field. While the first three parts are devoted to preparation and characterization of nanocatalysts, the final three provide in-depth insights into their applications in the fine chemicals industry, the energy industry, and for environmental protection, with expert authors reporting on real-life applications that are on the brink of commercialization. Timely reading for catalytic chemists, materials scientists, chemists in industry, and process engineers.

»Of Irises and Laser Cutters« shows how fertile the cooperation of people from different worlds can be. Artists and designers meet technicians and engineers, different cultures and ways of thinking meet each other. The focus is on the fascinating possibilities of digital fabrication technology. With their help, people who are globally networked, can use bits and bytes to create tangible objects, as well as being co-productive and creative across borders. The author advocates recognizing the creative potential of these global encounters and using their inherent diversity as an opportunity. Above all, young people need accessibility to these possibilities because they want to play an active role in shaping their future. This book gathers peer-reviewed contributions presented at the 2nd RILEM International Conference on Concrete and Digital Fabrication (Digital Concrete), held online and hosted by the Eindhoven University of Technology, the Netherlands from 6-9 July 2020. Focusing on additive and automated manufacturing technologies for the fabrication of cementitious construction materials, such as 3D concrete printing, powder bed printing, and shotcrete 3D printing, the papers highlight the latest findings in this fast-growing field, addressing topics like mixture design, admixtures, rheology and fresh-state behavior, alternative materials, microstructure, cold joints & interfaces, mechanical performance, reinforcement, structural engineering, durability and sustainability, automation and industrialization.

Reintroducing Materials for Sustainable Design provides instrumental theory and practical guidance to bring materials back into a central role in the design process and education. To create designs that are sustainable and respond to current environmental, economic and cultural concerns, practitioners and educators require a clear framework for materials use in design and product manufacturing. While much has been written about sustainable design over the last two decades, outlining systems of sustainability and product criteria, to design for material circularity requires a detailed understanding of the physical matter that constitutes products. Designers must not just know of materials but know how to manipulate them and work with them creatively. This book responds to the gap by offering a way to acquire the material knowledge necessary to design physical objects for sustainability. It reinforces the key role and responsibility of designers and encourages designers to take back control over the ideation and manufacturing process. Finally, it discusses the educational practice involved and the potential implications for design education following implementation, addressing didactics, facilities and expertise. This guide is a must-read for designers, educators and researchers engaged in sustainable product design and materials.

Whilst inkjet technology is well-established on home and small office desktops and is now having increasing impact in commercial printing, it can also be used to deposit materials other than ink as individual droplets at a microscopic scale. This allows metals, ceramics, polymers and biological materials (including living cells) to be patterned on to substrates under precise digital control. This approach offers huge potential advantages for manufacturing, since inkjet methods can be used to generate structures and functions which cannot be attained in other ways. Beginning with an overview of the fundamentals, this book covers the key components, for example piezoelectric print-heads and fluids for inkjet printing, and the processes involved. It goes on to describe specific applications, e.g. MEMS, printed circuits, active and passive electronics, biopolymers and living cells, and additive manufacturing. Detailed case studies are included on flat-panel OLED displays, RFID (radio-frequency identification) manufacturing and tissue engineering, while a comprehensive examination of the current technologies and future directions of inkjet technology completes the coverage. With contributions from both academic researchers and leading names in the industry, Inkjet Technology for Digital Fabrication is a comprehensive resource for technical development engineers, researchers and students in inkjet technology and system development, and will also appeal to researchers in chemistry, physics, engineering, materials science and electronics.

Digital fabrication has been termed the “third industrial revolution”, and is promising to revolutionize many disciplines, including most recently the construction sector. Both academia and industry see immense promise in cementitious materials, which lend themselves well to additive manufacturing techniques for digital fabrication in construction. With this

recent trend and high interest in this new research field, the 1st RILEM International Conference on Concrete and Digital Fabrication (Digital Concrete 2018) was organized. Since 2014, ETH Zurich has been host for the Swiss National Centre for Competence in Research (NCCR) for Digital Fabrication in Architecture, which is highly interdisciplinary and unique worldwide. In 2018, this NCCR opened the “DFAB House”, which incorporates many digital fabrication principles for architecture. It is also responsible for the 600 m² Robotic Fabrication Lab and the first robotically built roof in the world. Held in tandem with Rob|Arch 2018, the leading conference for robotics in architecture, RILEM deemed it the right time to combine forces at this new conference, which will be the first large conference to feature the work of the recently created RILEM Technical Committee on Digital Fabrication with Cement-based Materials, among other leaders in this new field worldwide. This conference proceedings brings together papers that take into account the findings in this new area. Papers reflect the varying themes of the conference, including Materials, Processing, Structure, and Applications. Design, DIY, and computer-controlled fabrication are a powerful combination for making high-quality customized things. Written by the founders of the architecture, design, and research firm Filson and Rohrbacher, this book takes you through the basics of CNC fabrication, the design process, production, and construction of your own furniture designs. Through their AtFAB series of projects, accompanied by an overview of digital techniques and design thinking, this book introduces the knowledge and skills that you'll find widely applicable across all kinds of CNC projects. Not only will you learn how to design, fabricate, and assemble a wide range of projects, you'll have some great furniture to show for it! While 3D printing has been grabbing headlines, high school, college, library, and other public makerspaces have been making things with CNC machines. With a CNC router, you can cut parts from strong, tactile, durable materials like wood. Once you have your design and material, you can set up your job and let it run. When it's done, you can put the project together for an heirloom of your own. While 3D printing can make exciting things with complex designs, CNCs are the digital workhorses that produce large-scale, long-lasting objects.

Digital Fabrications, the second volume in our new Architecture Briefs series, celebrates the design ingenuity made possible by digital fabrication techniques. Author Lisa Iwamoto explores the methods architects use to calibrate digital designs with physical forms. The book is organized according to five types of digital fabrication techniques: tessellating, sectioning, folding, contouring, and forming. Projects are shown both in their finished forms and in working drawings, templates, and prototypes, allowing the reader to watch the process of each fantastic construction unfold. Digital Fabrications presents projects designed and built by emerging practices that pioneer techniques and experiment with fabrication processes on a small scale with a do-it-yourself attitude. Featured architects include AEDS/Ammar Eloueini, Atelier Manferdini, Brennan Buck, MOS, Office dA, Florencia Pita/MOD, Mafoomby, URBAN A+O, SYSTEMarchitects, Andrew Kudless/Matsys, IwamotoScott, Atelier Hitoshi Abe, Chris Bosse, Tom Wiscombe/EMERGENT, Thom Faulders Architecture, Jeremy Ficca, SPAN, GNUFORM, Heather Roberge, PATTERNS, Ruy Klein, and servo.

Author Christopher Beorkrem shows how material performance drives the digital fabrication process and determines technique. He has recreated and dissected thirty-six of the most progressive works of architecture of the last few years, with perspectives from the designers so that you can learn from the successes and failures of each project. Including step-by-step diagrams and using consistent language and the

simplest construction techniques, he identifies the important characteristics of each material, including connection types, relative costs, deformation, color, texture, finish, dimensional properties, durability, and weathering and waterproofing to link the design outcomes to form. The book is divided into five parts by material – wood, metal, concrete, hybrids, and recycled – to help you reference construction techniques for the fabrication machines you have on-hand.

In this second edition of *Material Strategies in Digital Fabrication* are new case studies, improved wayfinding, the inclusion of composites and plastics, and references to similar strategies between different projects. In 400 step-by-step diagrams dissecting 39 case studies in 10 countries on 3 continents, the book shows you how material performance drives the digital fabrication process and determines technique. The book identifies the important characteristics of each material, including connection types, relative costs, deformation, color, texture, finish, dimensional properties, durability, and weathering and waterproofing to link design outcomes to form. The book is divided into five main chapters by material; wood, metal, concrete/masonry, composites/plastics, and recycled/pre-cycled, to help you reference construction techniques for the fabrication machines you have on-hand. Includes projects by SHoP Architects, Gramazio & Kohler, Schindlersalmeron, The Institute for Computational Design (Achim Menges, Patkau Architects, Sebastien Wierinck, Blue Dot Furniture, Marble Fairbanks, Studio Gang Architects, Macdowell.Tomova, Thomas Heatherwick Studio, Heather Roberge, MX3D, Matsys, Asbjorn Sondergaard, Block Research Group (Phillipe Block), Ball Nagues Studio, Matter Design, WORK Architecture Company, and SoftLab.

Many areas of knowledge converge in the building industry and therefore research in this field necessarily involves an interdisciplinary approach. Effective research requires strong relation between a broad variety of scientific and technological domains and more conventional construction or craft processes, while also considering advanced management processes, where all the main actors permanently interact. This publication takes an interdisciplinary approach grouping various studies on the building industry chosen from among the works presented for the 2nd International Conference on Construction and Building Research. The papers examine aspects of materials and building systems; construction technology; energy and sustainability; construction management; heritage, refurbishment and conservation. The information contained within these pages may be of interest to researchers and practitioners in construction and building activities from the academic sphere, as well as public and private sectors.

Robotic automation has become ubiquitous in the modern manufacturing landscape, spanning an overwhelming range of processes and applications-- from small scale force-controlled grinding operations for orthopedic joints to large scale composite manufacturing of aircraft fuselages. Smart factories, seamlessly linked via industrial networks and sensing, have revolutionized mass production, allowing for intelligent, adaptive manufacturing processes across a broad spectrum of industries. Against this background, an emerging group of researchers, designers, and fabricators have begun to apply robotic technology in the pursuit of architecture, art, and design, implementing them in a range of processes and scales. Coupled with computational design tools the technology is no longer relegated to the repetitive production of the assembly line, and is instead being employed for the mass-customization of non-standard components. This radical shift in protocol has been enabled by the development of new design to production workflows and the recognition of robotic manipulators as “multi-functional” fabrication platforms, capable of being reconfigured to suit the specific needs of a process. The emerging discourse surrounding robotic fabrication seeks to question the existing norms of manufacturing and has far reaching implications for the future of how architects, artists, and designers engage with materialization processes. This book presents the proceedings of Rob|Arch2014, the second international conference on robotic fabrication in architecture, art, and design. It includes a Foreword by Sigrid Brell-Cokcan and Johannes Braumann,

Association for Robots in Architecture. The work contained traverses a wide range of contemporary topics, from methodologies for incorporating dynamic material feedback into existing fabrication processes, to novel interfaces for robotic programming, to new processes for large-scale automated construction. The latent argument behind this research is that the term 'file-to-factory' must not be a reductive celebration of expediency but instead a perpetual challenge to increase the quality of feedback between design, matter, and making. Digital technologies are changing the relationship between design and construction: with computer models, CAD/CAM, and prototyping, designers can gain direct control of building and construction processes. The ability to digitally model designs, and thus to use those models directly in the context of production, creates a synthesis between design and construction in keeping with the tradition of the close relationship between design and craftsmanship, between the quality of the design and the rules of the craft. The evolution of the culture of design and construction is the underlying theme of this book. The aim is to discuss the direction that innovation is now taking, with a particular focus on today's cutting-edge architectures. The method addresses the ways in which different societies have dealt with the issues of their age regarding design and construction, the different contributions provided by various techniques, and with them the meanings expressed by the architecture. As building design using digital tools requires specific skills in the fabrication processes and in the languages used by information technology, the book also offers a practical guide to new methods and techniques of managing and controlling fabrication for AEC. A systematic analysis of new skills used in the design process presents an overview of opportunities for architects and engineers. By collecting information on significant projects and analyzing them, the book explores the technical and artistic potential of digital technology. The cases studied are the outcomes of groundbreaking projects which were able to give form and significance to technological research. They show that digital tools are not the exclusive prerogative of large firms but can also be adopted by teams working across small and medium-sized firms – firms which have been able to use informed research to link innovative design with the possibilities offered by digital fabrication in architecture.

Architectural pioneers such as Frank Gehry and Greg Lynn introduced the world to the extreme forms made possible by digital fabrication. It is now possible to transfer designs made on a computer to computer-controlled machinery that creates actual building components. This "file to factory" process not only enables architects to realize projects featuring complex or double-curved geometries, but also liberates architects from a dependence on off-the-shelf building components, enabling projects of previously unimaginable complexity. Digital Fabrications, the second volume in our new Architecture Briefs series, celebrates the design ingenuity made possible by digital fabrication techniques. Author Lisa Iwamoto explores the methods architects use to calibrate digital designs with physical forms. The book is organized according to five types of digital fabrication techniques: tessellating, sectioning, folding, contouring, and forming. Projects are shown both in their finished forms and in working drawings, templates, and prototypes, allowing the reader to watch the process of each fantastic construction unfold. Digital Fabrications presents projects designed and built by emerging practices that pioneer techniques and experiment with fabrication processes on a small scale with a do-it-yourself attitude. Featured architects include Ammar Eloueini/DIGIT-AL Studio, Elena Manfredini, Brennan Buck, Michael

Meredith/MOS, Office dA, Mafoomby, URBAN A+O, SYSTEM Architects, Andrew Kudless, IwamotoScott, Howeler Yoon, Hitoshi Abe, Chris Bosse, Tom Wiscombe/Emergent, Jeremy Ficca, SPAN, Urban A&O, Gnuform, Heather Roberge, Patterns, and Servo.

This expansive reference provides readers with the broadest available single-volume coverage of leading-edge advances in the development and optimization of clean energy technologies. From innovative biofuel feed stocks and processing techniques, to novel solar materials with record-breaking efficiencies, remote-sensing for offshore wind turbines to breakthroughs in high performance PEM fuel cell electrode manufacturing, phase change materials in green buildings to bio sorption of pharmaceutical pollutants, the myriad exciting developments in green technology described in this book will provide inspiration and information to researchers, engineers and students working in sustainability around the world. Architecture in the Digital Age addresses contemporary architectural practice in which digital technologies are radically changing how buildings are conceived, designed and produced. It discusses the digitally-driven changes, their origins, and their effects by grounding them in actual practices already taking place, while simultaneously speculating about their wider implications for the future. The book offers a diverse set of ideas as to what is relevant today and what will be relevant tomorrow for emerging architectural practices of the digital age.

3DP4E, a top resource website for 3D Printing enthusiasts from desktop hobbyists to teachers and businesses is collecting their favorite resources available on the website into a stylish eBook. The eBook contains information and links to 3DP4E's vast knowledge base of 3D Printing manufactures, artists, products, and services, presented cleanly and succinctly. This guide makes all the tools one would need available to begin their personal journey into the world of 3D Printing.

The book presents research from Rob|Arch 2018, the fourth international conference on robotic fabrication in architecture, art, and design. In capturing the myriad of scientific advances in robotics fabrication that are currently underway – such as collaborative design tools, computerised materials, adaptive sensing and actuation, advanced construction, on-site and cooperative robotics, machine-learning, human-machine interaction, large-scale fabrication and networked workflows, to name but a few – this compendium reveals how robotic fabrication is becoming a driver of scientific innovation, cross-disciplinary fertilization and creative capacity of an unprecedented kind.

- Digital Fabrication offers an informed overview of the impact of digital technologies on architectural fabrication today, providing a snapshot of the latest developments in the field, drawing upon the leading experts in architectural practice and education from across the world - Publication accompanies that of a companion volume - Computational Design ISBN 9787560873336 How are new digital fabrication technologies changing the ways in which architects are

constructing buildings today? Digital Fabrication offers a range of informed opinions on the subject written by some of the leading authorities in the world. It addresses new digital fabrication technologies, such as 3D printing, computer numerically controlled milling, along with other robotically controlled manufacturing operations, such as laser cutting, bandsaw cutting, stitching, weaving, forming, bending, folding and stacking. The volume is divided into different sections comprising Manifestos, Methodologies, Interviews and Projects, and also includes a helpful Introduction that offers a brief history of digital fabrication.

With the increasing sophistication of CAD and other design software, there is now a wide array of means for both designing and fabricating architecture and its components. The proliferation of advanced modelling software and hardware has enabled architects and students to conceive and create designs that would be very difficult to do using more traditional methods. The use of CAD technologies in the production of physical models, prototypes and individual elements is increasingly widespread through processes such as CAD/CAM, CNC milling and rapid prototyping. This translation of computer-generated data to physical artefact can also be reversed with devices such as a digitiser, which traces the contours of physical objects directly into the computer. This book focuses on the inspiring possibilities for architecture that can be explored with all the different technologies and techniques available for making complete designs or their components.

Miniaturization and mass replications have begun to lead the optical industry in the transition from traditional analog to novel digital optics. As digital optics enter the realm of mainstream technology through the worldwide sale of consumer electronic devices, this timely book aims to present the topic of digital optics in a unified way. Ranging from micro-optics to nanophotonics, and design to fabrication through to integration in final products, it reviews the various physical implementations of digital optics in either micro-refractives, waveguide (planar lightwave chips), diffractive and hybrid optics or sub-wavelength structures (resonant gratings, surface plasmons, photonic crystals and metamaterials). Finally, it presents a comprehensive list of industrial and commercial applications that are taking advantage of the unique properties of digital optics. Applied Digital Optics is aimed primarily at optical engineers and product development and technical marketing managers; it is also of interest to graduate-level photonics students and micro-optic foundries. Helps optical engineers review and choose the appropriate software tools to design, model and generate fabrication files. Gives product managers access to an exhaustive list of applications available in today's market for integrating such digital optics, as well as where the next potential application of digital optics might be. Provides a broad view for technical marketing managers in all aspects of digital optics, and how such optics can be classified. Explains the numerical implementation of optical design and modelling techniques. Enables micro-optics foundries to integrate the latest

fabrication and replication techniques, and accordingly fine tune their own fabrication processes.

This book presents an overview of the convergence of traditional letterpress with contemporary digital design and fabrication practices. Reflecting on the role of letterpress within the emergent hybrid post-digital design process, contributors present historical and contemporary analysis, grounded in case studies and current practice. The main themes covered include the research on letterpress as a technology and medium; a reflection on the contribution of letterpress to arts and design education; and current artistic and communication design practice merging past, present and future digital fabrication processes. This will be of interest to scholars working in graphic design, communication design, book design, typography, typeface design, design history, printing, and production technologies.

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.

The Winter 2012 (vol. 14 no. 3) issue of the *Nexus Network Journal* features seven original papers dedicated to the theme “Digital Fabrication”. Digital fabrication is changing architecture in fundamental ways in every phase, from concept to artifact. Projects growing out of research in digital fabrication are dependent on software that is entirely surface-oriented in its underlying mathematics. Decisions made during design, prototyping, fabrication and assembly rely on codes, scripts, parameters, operating systems and software, creating the need for teams with multidisciplinary expertise and different skills, from IT to architecture, design, material engineering, and mathematics, among others. The papers grew out of a Lisbon symposium hosted by the ISCTE-Instituto Universitario de Lisboa entitled “Digital Fabrication – A State of the Art”. The issue is completed with four other research papers which address different mathematical instruments applied to architecture, including geometric tracing systems, proportional systems, descriptive geometry and correspondence analysis. The issue concludes with a book review.

The book presents the proceedings of Rob/Arch 2016, the third international conference on robotic fabrication in architecture, art, and design. The work contains a wide range of contemporary topics, from methodologies for

incorporating dynamic material feedback into existing fabrication processes, to novel interfaces for robotic programming, to new processes for large-scale automated construction. The latent argument behind this research is that the term 'file-to-factory' must not be a reductive celebration of expediency but instead a perpetual challenge to increase the quality of feedback between design, matter, and making.

Exploring Digital Technologies for Art-Based Special Education details the use of digital technologies for inclusive art education, and showcases strategies for implementing arts-oriented technologies in primary- and secondary-level special education classrooms. Readers of the book will be presented with up-to-date research on this emerging topic, including chapters on the relation between pedagogical strategies and technological tools, digital animation and inclusivity, and accessibility in the 'flipped' art classroom. With contributions from a range of disciplinary angles—including art education, special education, educational philosophy, and educational technology—this book will cover a variety of digital tools for teaching art to students with disabilities, as well as the theoretical underpinnings specific to this interdisciplinary area of education research.

Digital Fabrications Architectural and Material Techniques Princeton Architectural Press

The digital transition of our economies is now entering a phase of broad and deep societal impact. While there is one overall transition, there are many different sectoral transformations, from health and legal services to tax reports and taxi rides, as well as a rising number of transversal trends and policy issues, from widespread precarious employment and privacy concerns to market monopoly and cybercrime. They all are fertile ground for researchers, as established laws and regulations, organizational structures, business models, value networks and workflow routines are contested and displaced by newer alternatives. This Research Handbook offers a rich and interdisciplinary synthesis of some of the current thinking on the digital transformations underway.

The Art of Digital Fabrication makes the case for designing and making art with digital fabrication technology and provides the resources for bringing that work to life. Contains over twenty-five beautiful makerspace tested STEAM projects, a material and process inventory for digital fabrication, and hardware and software guides.

Modern engineering often deals with customized design that requires easy, low-cost and rapid fabrication. Rapid prototyping (RP) is a popular technology that enables quick and easy fabrication of customized forms/objects directly from computer aided design (CAD) model. The needs for quick product development, decreased time to market, and highly customized and low quantity parts are driving the demand for RP technology. Today, RP technology also known as solid freeform fabrication (SFF) or desktop manufacturing (DM) or layer manufacturing (LM) is regarded as an efficient tool to bring the product concept into the product realization rapidly. Though all the RP technologies are additive they are still different from each other in the way of building layers and/or nature of building materials. This book delivers up-to-date information about RP technology focusing on the overview of the principles, functional requirements, design constraints etc. of specific technology.

Digital Fabrication in Interior Design: Body, Object, Enclosure draws together emerging topics of making that span primary forms of

craftsmanship to digital fabrication in order to theoretically and practically analyze the innovative and interdisciplinary relationship between digital fabrication technology and interior design. The history of making in interior design is aligned with traditional crafts, but a parallel discourse with digital fabrication has yet to be made evident. This book repositions the praxis of experimental prototyping and integrated technology to show how the use of digital fabrication is inherent to the interior scales of body, objects and enclosure. These three scales act as a central theme to frame contributions that reinforce the interdisciplinary nature of interior design and reinterpret traditional crafts by integrating new methods of making into conventional workflows. Featuring significant international practitioners and researchers, the selected contributions represent the ever-increasing interdisciplinary nature of design, demonstrating a breadth of disciplines. A foundational text for interiors students and practitioners, *Digital Fabrication in Interior Design* expands the necessary dialogue about digital fabrication at the scale of interiors to inform design theory and practice.

Digital fabrication combines virtual and material worlds; transforming thoughts into things, and things into data. It fosters complex and varied communities while enabling the pursuit of unique individual outputs. Current literature on digital fabrication concentrates on its technical and economic potential, with little attention yet being paid to the fundamental questions of how the technology might affect our understanding of identity, embodiment, or creative processes. Using case studies and experiences gained from ground-breaking fieldwork, "In the Making" explores these processes and their products from both cultural and aesthetic perspectives; with emphasis on its human interactions, not on technology. Embracing the absence of established methodologies in their emerging area of investigation, this volume offers a series of wide-ranging and original interdisciplinary framings which arise from the materials themselves. That very act of imagining, of selecting and committing to an envisaged but not yet physically present product, offers insights into needs and desires. What is the story of that design? How did it come to be? The basic principles of digital fabrication – the transformation from concept to physical entity – offer intriguing possibilities for aesthetic and cultural readings, particularly from the perspectives of disability. Online, open access maker communities mean that anyone with an internet connection and a desktop 3D printer is able to download and print a wide variety of replicable and customisable objects. What might this mean for disabled people? As digital fabrication technologies enter mainstream society, *In the making* poses urgently applicable questions about presence, existence, and authenticity and begins to suggest how we might explore them.

Deployable structures are mobile constructions with a great variety of spacial peculiarity, extent and layout. The documented workshop "Digital Fabrication & Deployable Structures" investigates in their history and tests how those flexible structures can be digitally fabricated and parametrically designed using lasercutting technology. The resulting prototypes were developed in a collaborative process and furthermore functionalized by the embedment into a narrative. Abbaubare Strukturen oder "Deployable Structures" sind mobile Konstruktionen mit einer großen Varianz in ihrer räumlichen Ausprägung, Ausdehnung und Anordnung. Während des dokumentierten Workshops "Digital Fabrication & Deployable Structures" wurde erst deren Geschichte untersucht und dann erprobt, wie eben solche flexiblen Strukturen mittels Lasercutting Technologie digital hergestellt und parametrisch entworfen werden können. Die Ergebnisse wurden in Gruppen prototypisch hergestellt und durch die Einbettung in einen Narrativ mit einer Funktion belegt.

Today's design professionals are faced with challenges on all fronts. They need not only to keep in step with rapid technological changes and the current revolution in design and construction processes, but to lead the industry. This means actively seeking to innovate through design research, raising the bar in building performance and adopting advanced technologies in their practice. In a constant drive to improve design processes and services, how is it possible to implement innovations? And, moreover, to assimilate them in such a way that design,

methods and technologies remain fully integrated? Focusing on innovations in architecture, this book covers new materials and design methods, advances in computational design practices, innovations in building technologies and construction techniques, and the integration of research with design. Moreover, it discusses strategies for integrating innovation into design practices, risks and economic impacts. Through numerous case studies, it illustrates how innovations have been implemented on actual architectural projects, and how design and technical innovations are used to improve building performance, as well as design practices in cutting-edge architectural and engineering firms. Projects of all scales and building types are discussed in the book, ranging from small-scale installations, academic and commercial buildings to large-scale mixed-use, healthcare, civic, academic, scientific research and sports facilities. Work from design firms around the globe and of various scales is discussed in the book, including for example Asymptote Architecture, cepezed, CO Architects, Consarc Architects, FAAB Architektura, Gerber Architekten, HOK, IDOM-ACXT, MAD Architects, Morphosis Architects, SDA | Synthesis Design + Architecture, Studiotrope, Perkins+Will, Richter Dahl Rocha & Associés, Snøhetta, Rob Ley Studio, Trahan Architects, UNStudio and Zaha Hadid Architects, among many others.

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