POST-PARAMETRIC AUTOMATION DESIGN AND CONSTRUCTION

ALFREDO ANDIA - THOMAS SPIEGELHALTER

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Post-Parametric Automation in Design and Construction Alfredo Andia, Thomas Spiegelhalter, 2014-11-01 Automation a mixture of algorithms robots software and avatars is transforming all types of jobs and industries This book responds to one critical question for the design and construction industry how are architects engineers and contractors using information technology to further automate their practices Addressing the use of new digital technologies particularly parametric automation for design and construction in the building industry this book looks at how technologically advanced architectural and engineering practices are semi automating their design processes by using sophisticated algorithms to transform their workflows The book also documents a set of firms that are further advancing automation by using pre fabrication modularization and custom designs via robotics **Proceedings of the 5th International Conference on Construction**, Architecture and Technosphere Safety Andrey A. Radionov, Dmitrii V. Ulrikh, Svetlana S. Timofeeva, Vladimir N. Alekhin, Vadim R. Gasiyarov, 2022-03-02 This book highlights recent findings in civil and environmental engineering and urban planning and provides an overview of the state of the art in these fields mainly in Russia and Eastern Europe A broad range of topics and issues in modern engineering are discussed including construction buildings and structures advanced materials innovative technology methods and techniques in civil engineering heating gas supply water supply and sewerage foundation engineering BIM structural reliability durability and monitoring special and unique structures construction bridge tunnel road railway engineering design and construction of hydraulic structures concrete engineering urban regeneration and sustainable development urban transport system engineering structure safety and disaster prevention water resources engineering water and wastewater treatment recycling and reuse of wastewater etc The volume gathers selected papers from the 5th International Conference on Construction Architecture and Technosphere Safety ICCATS held in Sochi Russia in September 2021 The authors are experts in various fields of engineering and all papers have been carefully reviewed

environmental sustainability of buildings and provides a key reference for architects on how digital technology can inform their practice Its four chapters cover developing strategies for improving sustainable and smart buildings architectural practice and construction technology creativity and innovation in building automation systems and the use phase of buildings Building Automation and Digital Technologies meets a critical need for a sustainable and smart built environment from an architectural perspective providing an important reference to architects and professionals in related fields by demonstrating the assimilation of the latest information and automation technologies Puts forward an architectural perspective on the design and construction of smart sustainable buildings Presents the use of digital technologies for design and construction Bridges the gap between architectural engineering and the use of automation and digital technology Considers the development of automated environmental conditions and new technology Design Practices to Facilitate Construction Automation John A. Gambatese, 2003 **Automation and Robotics in Construction XI** Alan Chamberlain, 2012-12-02 Sourced from international experts this book presents papers dealing with a wide range of soft and hard research issues at various stages of development in the field Some cover entirely new ground whilst others reflect progress on the sometimes frustrating path to truly robust technology Of particular interest are contributions discussing issues of exploitation and commercialisation the integration of end products within the design and construction processes incorporating information technology IT and the impact of the emerging technology on the culture and organisation of the construction industry A mark of growing maturity is apparent in the coverage of health and safety and related social issues This is complemented by a clear commitment to the consideration of human factors and the environment It is hoped that by promoting a wider debate on the matters of future technology and its horizons on the identification of what industry needs from the research and development community and on building effective partnerships between academia industry and government the publication not only addresses the practical commercial obligation to seek robust solutions for today s problems but will stimulate Digital Fabrication in Architecture, Engineering and Construction Luca research for the years to come Caneparo, 2013-10-02 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 Interconnecting Design Knowledge and Construction by Utilizing Adaptability and Configurability **in Robotics** Sven Christoph Stumm, 2018 Parametric Design Approach in Architecture Between Concept and Reality, Theory and Practice. The Impact on Its Users and the Existing Setting Wissam Elmawi, 2023-04-19 Master's Thesis from the year 2022 in the subject Art Architecture History of Construction grade 1 8 Anhalt University of Applied Sciences Bauhaus Dessau course Design Research language English abstract This research investigates the evaluation of parametric based architecture in relation to its users and the surrounding environment The Phaeno Science Centre in Germany serves as a case study raising questions about how well the building fits with its local setting and users The study adopts a qualitative and quantitative methodology known as Post Occupancy Evaluation which seeks feedback from building users and architects The research emphasizes the need to distinguish between the behavior of complex systems and their users and the existing setting It stresses that evaluating parametric architecture requires an understanding of the whole context rather than just a single structure The study also suggests that architects should focus on the connectivity between built structures and users rather than ignoring it In addition the study highlights the importance of evaluating architecture in general and parametric architecture in particular given its widespread use in our built environment It advocates for the inclusion of the Post Construction Evaluation phase in the conventional core phases of the Architectural Design Process making it just as important as other stages The methodology for this study involves gathering data from numerous sources including users locals architects professionals journals newspapers libraries interviews surveys site visits and personal reflections By incorporating multiple viewpoints the study hopes to gain a comprehensive understanding of the perceptions surrounding parametric architecture Overall the study emphasizes the importance of evaluating parametric based architecture in relation to its users and the existing environment It stresses the need for architects to focus on the functiona Industry 4. 0 Solutions for Building Design and Construction Farzad Pour Rahimian, 2021-12-21 This book provides in depth results and case studies in innovation from actual work undertaken in collaboration with industry partners in Architecture Engineering and Construction AEC CAD and Robotics in Architecture and Construction ,1986 **Design Automation** Zachary Kron, 2021-02-09 Design Automation From Building Objects to Building Functions the second book in the Practical

Revolutions series is a roadmap for design technology specialists and practicing architects for the implementation of design automation processes in existing AEC firm workflows Through the lens of three concepts automation of rote tasks design assist and systems integration this book offers comprehensive guidance on advanced methods in process automation and optimization visually engaging and practical examples of computational design tools and clear return on investment for practicing professionals to use and advocate for design automation processes on projects of all sizes This book offers accessible methods for small to mid size AEC firms for differentiating their products and streamlining operations About the series Practical Revolutions Disruptive Technologies and their Applications to Building Design and Construction drives the conversation of the practical deployment of emerging technologies in the building industries It is a central information source for building professionals seeking to advance their individual capabilities and their firm s practices Each volume in the series will cover an emerging technology paradigm Volumes in the series will cover Digital Sketching Design Automation 5D Building Information Modeling Construction Automation and Robotics Building Data Modeling and Smart Buildings and **Architecture and Engineering** Ian White, Alexander Tzonis, 1993 Development of the Integrated Environments Construction Automation Design Methodology Alexander H. Slocum, Society of Manufacturing Engineers, Robotics International of SME., 1986 Automation in Construction toward Resilience Ehsan Noroozinejad Farsangi, Mohammad Noori, Tony T.Y. Yang, Paulo B. Lourenço, Paolo Gardoni, Izuru Takewaki, Eleni Chatzi, Shaofan Li, 2023-09-29 While the word automation may conjure images of robots taking over jobs the reality is much more nuanced In construction for instance automation is less likely to diminish employment opportunities than it is to increase productivity Indeed automation alongside the global need for new and updated infrastructure and better and more affordable housing can help shape the direction of the construction industry. The key will be anticipating and preparing for the shift in part by developing new skills in the current and future workforce This book presents all aspects of automation in construction pertaining to the use of information technologies in design engineering construction technologies and maintenance and management of constructed facilities The broad scope encompasses all stages of the construction life cycle from initial planning and design through the construction of the facility its operation and maintenance to the eventual dismantling and recycling of buildings and engineering structures Features Examines Building Information Management systems allowing on site execution of construction more efficient and for project teams to eliminate mistakes and better coordinate the workforce Presents the latest information on the automation of modular construction production in factories including 3 D printing of components such as facades or even load bearing and essential components Facilitating Design with Parametric Construction Methods Michael C. Monks, 1993 From Control to Design Tomoko Sakamoto, 2008 Designing for Construction Automation Thomas Michael Gatton, 1991 One of the primary technical barriers to construction automation is the inability of advanced manufacturing production technologies to perform many construction activities Current construction methods have evolved based on the physical sensory and decision making abilities of human beings Machine sensor and adaptive capabilities are not nearly as sophisticated as those of humans and therefore automated machinery cannot accomplish many construction operations as they are presently performed with manual techniques To automate many construction activities operations must be designed that are within the capabilities of the machinery A quantitative method is needed to evaluate and measure the amenability that construction tasks have to automation The amenability of a construction task to automation is defined as automated constructibility A method to measure automated constructibility is needed to Design for Construction Automation This research addresses the issue of automated constructibility A quantitative method to evaluate automated constructibility of construction tasks is developed This method analyzes design characteristics through a process of reverse construction and converts them into construction requirements The construction requirements contain motion accuracy stability and environmental characteristics of the construction task These characteristics are converted into a task manifold chart and a task performance environment chart which comprise the automated constructibility criteria Certain patterns of automated constructibility criteria indicate automated constructibility and technical feasibility for automation in the performance of that task

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