PROCEEDINGS

ACADIA // 2016

POSTHUMAN FRONTIERS: DATA, DESIGNERS, AND COGNITIVE MACHINES

Proceedings of the 36th Annual Conference of the Association for Computer Aided Design in Architecture

University of Michigan Taubman College of Architecture and Urban Planning, Ann Arbor

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Associate Dean for Research and Creative Practice, Associate Professor, University of Michigan Taubman College
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Geoffrey Thün holds a Masters of Urban Design from the University of Toronto, and a Bachelor of Architecture and Bachelor of Environmental Studies from the University of Waterloo. He is currently an Associate Dean of Research and Associate Professor at the Taubman College of Architecture and Urban Planning at the University of Michigan where he teaches design studios, courses in urban systems, site operations, and material systems.

Thün is a founding partner of the research-based practice RVTR, which serves as a platform for exploration and experimentation in the agency of architecture and urban design within the context of dynamic ecological systems, infrastructures, materially and technologically mediated environments, and emerging social organizations. He exhibited at the 2016 Venice Architecture Biennale and his academic research and creative practice has collected many awards and accolades which most recently includes an R+D Honorable Mention (2016) and an R+D Award (2011) from Architect Magazine, Journal of Architectural Education Best Design as Research Article (2013), The Architizer A+ Award Program’s Architecture + Sound Jury Award (2013), and an ACSA Faculty Design Award (2012).
Sean Ahlquist holds a Master of Architecture from the Emergent Design and Technologies Program at the Architectural Association in London. As a part of the Cluster in Computational Media and Interactive Systems, his work connects Architecture with the fields of Material Science, Computer Science, Art & Design, and Music, with particular focus on material computation.

Ahlquist’s research formulates computational design frameworks where materiality functions as an a priori agent in the organization of architectural systems and their spatial tectonics. As an Assistant Professor at Taubman College of Architecture and Urban Planning at the University of Michigan, Ahlquist teaches at all levels, including ongoing involvement with the Master of Science in Material Systems program. Ahlquist continues to publish widely on the topic of computational design, including a reader entitled Computational Design Thinking, co-edited with Achim Menges, which collects and reflects upon seminal texts formulating a systems and material based approach to architecture and design methodologies.

Kathy Velikov
TECHNICAL COMMITTEE CO-CHAIR
Associate Professor, University of Michigan Taubman College
Founding Principal, RVTR

Kathy Velikov holds a Master of Arts from the University of Toronto and a Bachelor of Architecture and Bachelor of Environmental Studies from the University of Waterloo. As an Associate Professor at Taubman College of Architecture and Urban Planning at the University of Michigan, Velikov teaches design studio, ecology, technology, and urbanism courses in the Architecture program, as well as courses in the Master of Science in Material Systems program.

Velikov is a registered architect and founding partner of the award winning research-based practice RVTR, which serves as a platform for exploration and experimentation in the agency of architecture and urban design within the context of dynamic ecological systems, infrastructures, materially and technologically mediated environments, and emerging social organizations. She exhibited at the 2016 Venice Architecture Biennale and is co-author of Infra Eco Logi Urbanism (Park Books, 2015), has been published in IJAC, Leonardo, JAE, New Geographies, eVolo, Volume, [bracket] Goes Soft, and MONU, and has work in Brownell and Swackhamer’s Hypernatural, Ng and Patel’s Performative Materials in Architecture, Gerber and Ibanez’s Paradigms in Computing, and Trubiano’s High Performance Homes.
Chilean born and Austrian native, Matias del Campo graduated with distinction from the University of Applied Arts in Vienna, Austria. del Campo co-founded SPAN Architects in 2003 with Sandra Manninger and the globally-acting practice has become known for its sophisticated application of contemporary technologies in architectural production. The practice investigates the architectural qualities of sensorial and spatial conditions informed by Baroque geometries, romantic atmospheres, and biological systems, as they are combined with the manifold qualities of contemporary, algorithm-driven approaches.

As Associate Professor of Architecture at Taubman College of Architecture and Urban Planning at the University of Michigan, del Campo explores robotic fabrication processes as they relate to formal and tectonic architectural tendencies. del Campo’s work has garnered wide recognition, including first place competition entry for the Austrian Pavilion at the Shanghai World Expo in 2010, first place winning competition entry for the new Brancusi Museum in Paris, France in 2008, and the exhibition of the work of SPAN at the Venice Architecture Biennale in 2012.

Wes McGee is an Assistant Professor in Architecture and the Director of the FABLab at the University of Michigan Taubman College of Architecture and Urban Planning. His work revolves around the interrogation of machinic craft and material performance, with a research and teaching agenda focused on developing new connections between design, engineering, materials, and process as they relate to the built environment through the creation of customized software and hardware tools. With the goal of seamlessly integrating fabrication constraints with design intent, the work spans multiple realms, including algorithmic design, computational feedback of material properties, and the development of novel production processes which utilize industrial robots as bespoken machines of architectural production.

As a founding partner and senior designer in the studio Matter Design, his work spans a broad range of scales and materials, always dedicated to re-imagining the role of the designer in the digital era. In 2013 Matter Design was awarded the Architectural League Prize for Young Architects & Designers. Wes frequently presents work at national and international conferences on design and fabrication, and the work of Matter Design was recently featured in the book PostDigital Artisans by Jonathan Openshaw (Frame publishers), as well as “Next Progressives” in Architect Magazine. In 2014 he was the co-chair of the Robots in Architecture Conference, hosted at the University of Michigan.
Catie Newell is an Assistant Professor of Architecture at the University of Michigan’s Taubman College of Architecture and Urban Planning. Newell joined the faculty in 2009 as the Oberdick Fellow. She received her Masters of Architecture from Rice University and a Bachelor of Science in Architecture from Georgia Tech. Newell teaches design and fabrication courses and is heavily involved in the Masters of Science in Material Systems concentration. Newell is also the founding principal of Alibi Studio. Newell’s creative practice has been widely recognized for exploring design construction and materiality in relationship to the specificity of location and geography and cultural contingencies. Newell has won the SOM Prize for Design, Architecture and Urban Design, the Architectural League Prize for Young Architects and Designers, and the ArtPrize Best Use of Urban Space Juried Award. Alibi Studio has exhibited at the 2012 Architecture Venice Biennale and at the 2015 Lille3000 Triennial. In 2013 Newell was awarded the Cynthia Hazen Polsky and Leon Polsky Rome Prize in Architecture. She is a Fellow of the American Academy in Rome.

Sandra Manninger began her training at the Federal Higher Technical Institute for Education and Experimentation in Graz, Austria. She then joined the Technical University in Vienna where she graduated as an architect under the auspices of Bart Lootsma. Manninger is currently Assistant Professor of Practice at Taubman College of Architecture and Urban Planning at the University of Michigan. Manninger is Co-founder of SPAN Architects together with Matias del Campo. The practice focuses on the integration of advanced design and building techniques that folds, nature, culture, and technology into one design ecology.

Sandra Manninger received a Research Fellowship, awarded from the University for Applied Arts Vienna, the Schindler Scholarship, awarded by the Federal Ministry for Education and Art together with the Museum for Applied Art Vienna, and most recently a Research Fellowship at CERN, granted by the Federal Chancellery Austria. She has received numerous awards such as the Ephemeral Structures Competition in Athens, the Architecture and Digital Fabrication competition, the competition for the new Media Center of the University for Music and Performance Art, Vienna, or the Experimental Tendencies in Architecture award granted by the Republic of Austria. She has won numerous architecture competitions such as the Brancusi Museum in Paris, the PUGA (a mobile Public Gallery), the bidding for the HAWK Headquarters, and the Austrian Pavilion for the Shanghai Expo.

Her work is part of the permanent collection of the FRAC Centre Orleans, the Luciano Benetton Collection, the MAK Museum of Applied Arts, the Albertina in Vienna, and the Pinakothek in Munich and she has been published in numerous magazines and books. She has written and presented papers at numerous conferences and considers herself lucky to travel the world to counsel and lecture at various institutions.
Session Moderators

Ellie Abrons
Assistant Professor, University of Michigan Taubman College
Principal, EADO
Member, T+E+A+M

Ellie Abrons is a designer, educator, and the principal of EADO. She is an Assistant Professor at the University of Michigan’s Taubman College of Architecture and Urban Planning, where she was the A. Alfred Taubman Fellow in 2009–2010. Her work focuses on material experimentation and reuse, digital fabrication, and explorations of formal allusion. Ellie received her M.Arch from the University of California Los Angeles, where she graduated with distinction, and her BA in art history and gender studies from New York University. Ellie is the recipient of a residency fellowship at the Akademie Schloss Solitude in Stuttgart, Germany and her work has been exhibited at the Venice Biennale, Storefront for Art and Architecture, A+D Gallery, and the Architectural Association. An exhibition of Ellie’s work, entitled Inside Things, was recently shown at SCI-Arc and she is a contributor (as part of T+E+A+M) to the U.S. Pavilion at the 2016 Venice Architecture Biennale.
Dana Cupkova is a founding partner and principal of Epiphyte Lab, an interdisciplinary design and research practice. She currently holds the Lucian & Rita Caste Assistant Professorship at Carnegie Mellon University’s School of Architecture; and serves as a Track Chair for the school’s MSSD program.

Dana’s design work studies the built environment at the intersection of ecology, computational processes, and systems analysis. In her research, she interrogates the relationship between design-space and ecology as it engages computational methods, thermodynamic processes, and experimentation with geometrically-driven performance logic.

Her current design-research in collaboration with manufacturing industry has been supported by the NYSCA Grant, the Center for Architecture Foundation Arnold W. Brunner Grant, the Cornell University Faculty Innovation Grant, Architectural League of NY, AIA Urban and Regional Solution Grant, the Pennsylvania Infrastructure Technology Alliance Grant, etc; presented and published internationally at venues and conferences such as ACADIA, IAC, Design Modeling Symposium and others.

Neil Leach teaches at the European Graduate School, Tongji University and Florida International University, and is a member of the Academia Europaea. He has been working on a NASA funded research project to develop robotic fabrication technologies to print structures on the Moon and Mars. He has published 27 books including Designing for a Digital World (Wiley, 2002), Digital Tectonics (Wiley, 2004), Digital Cities (Wiley, 2009), Machinic Processes (CABP, 2010), Fabricating the Future (Tongji UP, 2012), Scripting the Future (Tongji UP, 2012), Robotic Futures (Tongji UP, 2015) and Digital Factory: Advanced Computational Research (CABP, 2016).
Paul Nicholas holds a PhD in Architecture from RMIT University, Melbourne Australia. After co-founding the design firm Mesne Design Studio, and practicing with Arup Consulting Engineers from 2005 and AECOM/Edaw from 2009, Paul joined the Centre for Information Technology and Architecture (CITA), Copenhagen Denmark in 2011. Paul is currently head of the masters programme CITAstudio: Computation in Architecture. Paul’s particular interest is the development of innovative computational approaches that establish new bridges between design, structure, and materiality. His recent research explores sensor enabled robotic fabrication, multiscale modeling, and the idea that designed materials such as composites necessitate new relationships between material, representation, simulation and making.

Gilles Retsin is the founder of Gilles Retsin Architecture, a young award-winning London based architecture and design practice, investigating new architectural models which engage with the potential of increased computational power and fabrication to generate buildings and objects with a previously unseen structure, detail and materiality. He graduated from the Architectural Association Design Research Lab in London. Alongside his practice, Gilles directs a Research Cluster at UCL - the Bartlett school of Architecture investigating robotic manufacturing and large-scale 3D printing, and he is a senior lecturer at UEL.
Jenny E. Sabin is an architectural designer whose work is at the forefront of a new direction for 21st century architectural practice—one that investigates the intersections of architecture and science, and applies insights and theories from biology and mathematics to the design of material structures. She is principal of the award-winning practice, Jenny Sabin Studio, an experimental architectural design studio based in Ithaca and Director of the Sabin Design Lab at Cornell AAP, a trans-disciplinary design research lab with specialization in computational design, data visualization and digital fabrication. Sabin is the Arthur L. and Isabel B. Wiesenberger Assistant Professor in the area of design and emerging technologies and Director of Graduate Studies in the Department of Architecture at Cornell University. Sabin’s collaborative research and design including bioinspired adaptive materials and 3D geometric assemblies has been funded substantially by the National Science Foundation with applied projects commissioned by diverse clients including Nike Inc., Autodesk, the Cooper Hewitt, the FRAC, the American Philosophical Society Museum, the Museum of Craft and Design, the Philadelphia Redevelopment Authority and the Exploratorium.

Jose Sanchez is an Architect / Programmer / Game Designer based in Los Angeles, California. He is the director of the Plethora Project, a research and learning project investing in the future of on-line open-source knowledge. He is also the creator of Block’hood, an award-winning city building video game exploring notions of crowdsourced urbanism named by the Guardian one of the most anticipated games of 2016.

He has taught and guest lectured in several renowned institutions across the world, including the Architectural Association in London, the University of Applied Arts (Angewandte) in Vienna, ETH Zurich, The Bartlett School of Architecture, University College London, and the Ecole Nationale Supérieure D’Architecture in Paris.

Today, he is an Assistant Professor at USC School of Architecture in Los Angeles. His research ‘Gamescapes’, explores generative interfaces in the form of video games, speculating in modes of intelligence augmentation, combinatorics and open systems as a design medium.
Kyle Steinfeld
Assistant Professor of Architecture, University of California, Berkeley

Kyle Steinfeld, Assistant Professor specializing in digital design technologies, is the author of the forthcoming “Geometric Computation: Foundations for Design”, a text that seeks to demystify computational geometry for an audience of architecture students and design professionals, and is the creator of Decod.es, a platform-agnostic geometry library intended to promote computational literacy in creative design. He has been the recipient of a number of fellowships for research in design technology, recently serving as an IDEA fellow at Autodesk in 2014 and as a Hellman Fellow in 2012. His broad research interests include collaborative design technology platforms, design computation pedagogy, and bioclimatic design visualization. Professionally, he has worked with and consulted for a number of firms, including SOM, Acconci Studio, KPF, Höweler+Yoon, and Diller+Scofidio. He teaches design studios, core courses in representation, and advanced seminars in digital modeling and visualization.

Dr. Philip Yuan
Professor of Digital Design Research Center (DDRC), the College of Architecture and Urban Planning (CAUP), Tongji University
Founding partner of ARCHI-UNION and FAB-UNION
Council Member of Architecture Society of China (ASC) - Co-founder of Digital Architecture Design Association (DADA) in ASC

Philip F. Yuan is dedicating in the combination of research, pedagogy and design experiments. The major research field is on the methodology of computational design and fabrication. The research consists of the fabrication of computational material research, robotic fabrication technology, the prototype of future digital factory, etc. Furthermore, the research also contains the Integration of Physical Wind Tunnel and CFD Simulation Technology as well as Acoustics and Theater Design. Philip F. Yuan has published books including A Tectonic Reality, Fabricating the Future, Scripting the Future, Theater Design, Robotic Futures, From Diagrammatic Thinking to Digital Fabrication and Digital Workshop in China. Philip F. Yuan has been honored the Youth Architects Prize of ASC, the Nomination Award in 2014 ARC SIA, Feng Jizhong Architectural Education Award, Public prize of Shenzhen Biennia, etc. And he has also been shortlisted for WA China Architectural Award of World Architecture and the 2014 Wienerberger Brick Award.
ACADIA Organization

The Association for Computer Aided Design in Architecture (ACADIA) is an international network of digital design researchers and professionals that facilitates critical investigations into the role of computation in architecture, planning, and building science, encouraging innovation in design creativity, sustainability and education.

ACADIA was founded in 1981 by some of the pioneers in the field of design computation including Bill Mitchell, Chuck Eastman, and Chris Yessios. Since then, ACADIA has hosted over 30 conferences across North America and has grown into a strong network of academics and professionals in the design computation field.

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Geoffrey Thün  Associate Professor, University of Michigan
Skylar Tibbits  Research Scientist, MIT
Bige Tuncer  Associate Professor, Singapore University of Technology and Design
Kathy Velikov  Associate Professor, University of Michigan
Joshua Vermillion  Assistant Professor, University of Nevada-Las Vegas
Peter von Buelow  Full Professor, University of Michigan
Michael Weinstock  Director, Emergent Technologies and Design AA School of Architecture
Andrew Wit  Assistant Professor, Temple University
Andrew Witt  Assistant Professor, Harvard University
Robert Woodbury  Distinguished Professor/Endowed Chair, Simon Fraser University
Wei Yan  Associate Professor, Texas A&M University
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The ACADIA 2016 Conference assembles a diverse set of selections from across the spectrum of exemplary research and creative practice currently being undertaken by the ACADIA community. POSTHUMAN FRONTIERS aims to foster design work and research from the worlds of practice and academia that is positioned at the intersection of procedural design, digital environments, and autonomous machines. More specifically, the conference explores recent work within the current trends in computational design to develop and apply quasi-cognitive machines; the integration of software, information, fabrication and sensing to generate mechanisms for interfacing with the physical realm.

The conference event is supported by the research networks of Taubman College of Architecture and Urban Planning at the University of Michigan. ACADIA 2016: POSTHUMAN FRONTIERS: Data, Designers, and Cognitive Machines was held in Ann Arbor, Michigan, on October 27–29, 2016.