

Joseph Choma is the Founder of the Design Topology Lab and an Associate Professor of Architecture at Clemson University. He is the author of three books: *Morphing: A Guide to Mathematical Transformations for Architects and Designers* (Laurence King Publishing, 2015), *Études for Architects* (Routledge, 2018) and *The Philosophy of Dumbness* (ORO Editions, 2020). As a researcher, his interests lie at the intersection of mathematics, folding, structure and materials. He has received awards from both the American Institute of Architects and the American Composites Manufacturers Association. His recent material explorations have been noted by CompositesWorld Magazine as "spearheading research into the use of foldable composites." In 2018, he was a keynote speaker at the Future of Architecture and Building Biennale in Mumbai, India. In 2019, he was a keynote speaker at FAB15 in Egypt. Recently, he was selected for the 2019-20 NCCR Digital Fabrication Researcher in Residence at the ETH Zurich.

EDUCATION

University of Cambridge, UK (Sidney Sussex College)

Doctor of Philosophy in Architecture, *Candidate* (anticipated 2020)

(Cambridge International Scholarship / Patron: HRH The Prince of Wales)

Dissertation: *Foldable Structures and Materials*

Keywords: curved crease origami, foldable composites, deployable structures, ultra-thin formwork

Supervisor: Michael Ramage

Advisor: Allan McRobie

Massachusetts Institute of Technology, Cambridge, MA

Master of Science in Architecture Studies, Design and Computation, 2011

(Full Tuition Merit Scholarship / GPA 5.0)

Thesis: *A Pedagogical Guide into Trigonometric Transformations*

Keywords: mathematics, computational geometry, epistemology

Advisor: George Stiny

Reader: Nader Tehrani

Rensselaer Polytechnic Institute, Troy, NY

Bachelor of Architecture, Minor in Studio Arts, 2009

(Rensselaer Medalist)

Thesis: *Having a Conversation with Architecture*

Keywords: second-order cybernetics, interactive architecture, pneumatic structures

Mentor: Ted Krueger

ACADEMIC

Clemson University, July 2014 – Present

Associate Professor of Architecture (Tenure), May 2019 – Present

Assistant Professor of Architecture (Tenure-Track), June 2015 – May 2019

Visiting Lecturer, School of Architecture (Full-Time), July 2014 – May 2015

COURSES

Arch 3510 and Arch 8570: Fluid Studio, Fall 2019, Spring 2020 (B.A. and M.Arch. design studio)

Arch 1510: Architecture Communications 1, Spring 2020 (Core design studio)

Arch 2510: Architectural Foundations 1, Fall 2014, 2015, 2016, 2018 (Core design studio)

Arch 2511: Architectural Foundations 1 Laboratory: Digital Tooling, Fall 2014 - 2017 (Core lab)

Arch 8100: Visualization and Representation 1, Fall 2015, 2016, 2018, 2019 (Required M.Arch. course)

Arch 2520: Architectural Foundations 2, Spring 2015, 2016, 2017, 2019 (Core design studio)

Arch 2521: Architectural Foundations 2 Laboratory: Digital Tooling 2, Spring 2015 - 2018 (Core lab)

Arch 8110: Visualization and Representation 2, Spring 2016 (Required M.Arch. course)

Arch 4990: Composite Structures, Spring 2019 (Elective)

Arch 4990: Composites Manufacturing for Architectural Applications, Spring 2017 (Elective)

Industry supported elective with donated materials

SERVICE

Pedagogy Development

Individually authored all exercises for Architectural Foundations 1, Fall 2014 - 2017

Primary individual responsible for the integration of digital tooling into all foundations studios, Fall 2014 - Present

Created a new course for Visualization and Representation 1, Fall 2015 - 2017

Created a new industry sponsored elective, Spring 2017

Co-created a new elective in collaboration with M. Wesam Al Asali (Cambridge, UK), Spring 2019

Part of the collaborative team that developed Architectural Foundations 2, Spring 2015 - 2018

Created multiple research-based design studios, Fall 2019 and Spring 2020

Committees

Member of the Masters to PhD Committee, Fall 2019 - Present
 Member of the Architecture Curriculum Committee, Fall 2019 - Present
 Member of the Faculty Advisory Committee, Fall 2019 - Present
 Member of the Digital Ecologies Certificate Program, Fall 2016 - Present
 Member of Teaching Stream: Design, Fall 2016 - Present
 Member of the University's STEAM Collective (Nine Member Interdisciplinary Academic Team), Fall 2015 - Present
 Member of the University's STEAM Task Force, Fall 2014 - Fall 2017
 Coordinator of 2nd Year Undergraduate Studios, Spring 2017
 Faculty and Student Advisory Committee (Second Year Faculty Representative), Fall 2015 - Spring 2016
 Member of the Studio Learning Cultures Task Force, Fall 2015 - Spring 2016
 Member of the Search and Screen Committee for Endowed Chair / Director of CU-iMSE, Fall 2016 - Spring 2018
 Member of the Search and Screen Committee for Lecturers, Spring 2019
 Member of the NAAB Lee Hall Exhibit Committee, Spring 2016 - Spring 2017
 Clemson Thinks 2 Instructor, Fall 2015 - Present

Advising

Primary PhD Advisor for Fabio Scotto, [forthcoming Fall 2021]
 On the doctoral committee of Sida Dai, Fall 2019 - Present
 On the doctoral committee of Mostafa Hashem, Spring 2015 - Spring 2018
 Advising 40 undergraduate students each academic year, Fall 2015 - Present

Editor of *Poché* -Clemson University Architecture's student publication, Spring 2016

Paperback: 220 pages, 234mm x 160mm, Clemson University Architecture (January 2017)

Poché is the "stuff" between the walls and floors. In plans and sections it is usually filled in or hatched. However, there is a lot that goes into that mysterious hatch. This publication literally cuts through required courses at Clemson University Architecture, as a means to pause and reflect.

Kennesaw State University, July 2011 – May 2014 (formerly known as Southern Polytechnic State University) Assistant Professor of Architecture (Tenure-Track)

COURSES

Design Foundations 1, Fall 2011, 2012, 2013 (Core design studio)
 Design Communications 1, Fall 2012 (Required course)
 Design Foundations 2, Spring 2012, 2013, 2014 (Core design studio)
 Design Communications 2, Spring 2014 (Required course)
 Constrained to be Unconstrained, Spring 2012, 2013 (Advanced elective)
 Environmental Technologies 1, Fall 2011, 2013 (Required course)

SERVICE

Pedagogy Development

Co-authored all exercises with Durham Crout for Design Foundations 1, Fall 2012 - 2013
 Co-authored all exercises with Durham Crout for Design Foundations 2, Spring 2013 - 2014
 Created a new advanced elective on tooling constraints, Spring 2012 - 2013
 Created a new course for Design Communications 2, Spring 2014

Committees

Chair of Lecture, Workshop and Exhibition Series, Fall 2012 - Spring 2014
 Coordinator of 1st Year, Fall 2012 - Spring 2014
 Coordinator of Digital Fabrication Lab, Fall 2011 - Spring 2014
 Member of University Information Technology Advisory Committee, Fall 2012 - Spring 2014
 Member of Academic Council, Fall 2012 - Spring 2014
 Member of Research Advisory Committee, Fall 2012 - Spring 2014
 Member of Curriculum Development Committee, Fall 2012 - Spring 2014
 Library Representative for the Architecture Program, Fall 2011 - Spring 2014
 Member of Search and Screen Committee for Professor of History and Theory, Spring 2012
 Co-Chair of Search and Screen Committee for Supervisor and Shop Manager, Spring 2012

Boston Architectural College, September 2010 – May 2011 Instructor, School of Architecture

COURSE

trans-FORM: Tacit to Explicit, Fall 2010, Spring 2011 (Advanced elective)

Massachusetts Institute of Technology, September 2009 – May 2011
Teaching Assistant, Department of Architecture

COURSES

MArch Level III Option Studio, Professor Andrew Scott (Director of MArch Program) Spring 2011
Digital Fab. & Construct: Apps Workshop, Professor Dennis Shelden (Gehry Technologies) Fall 2010
MA Level I Core Studio, Professor Ana Miljacki (Project_) Spring 2010
MArch Level II Core Studio, Professor Nader Tehrani (NADAAA) Fall 2009

RESEARCH AS PRACTICE

Design Topology Lab, May 2009 – Present, *Founder and Director*

“...the first research practice dedicated to the ontology of space defined by mathematics.”
-Archinect (August 18, 2011)

Primary Research: **Foldable Structures and Materials** (2017 - Present)

Folding is a systematic method that transforms planar material into three-dimensional rigid structures. Depending on the organization of folds, structures can be flat-packed for ease of transport. By beginning with a flat plane, there is the potential to reduce production costs associated with manufacturing parts with curvature. Additionally, there are numerous variations possible with one systematic method.

This research seeks to move beyond origami – the art of folding paper – by embracing material and structural constraints. Computation-based simulation and analysis is used to design stronger lightweight structures. Additionally, more efficient methods to manufacture parts are being developed in direct dialogue with industry sponsors and collaborators. Lastly, new methods and materials are being invented to expand the possibilities of translating paper folding into materials which have the potential to scale-up. Folding is embraced as a means to tackle industry related problems. Applications include: lightweight deployable structures, ultra-thin formwork for concrete casting, and stay-in-place formwork for shell structures and concrete slabs.

Current Research Project: **Ultra-thin folded paper formwork with set-on-demand casting** (June 2019 - Present)

Principal Investigators: Joseph Choma, Clemson University and Ena Lloret-Fritschi, ETH Zurich
Collaborators: Gramazio Kohler Research, ETH Zurich and Physical Chemistry of Building Materials, ETH Zurich
Funding: SPARK SNSF Grant

Current Research Project: **Cable-locking foldable structures** (2020 - Present)

Principal Investigator: Joseph Choma, Clemson University
Industry sponsors: Composites One, Vectorply, Entropy Resins

Current Research Project: **Lightweight deployable structures with foldable composites** (2017 - Present)

Principal Investigator: Joseph Choma, Clemson University
Industry sponsors: Composites One, Vectorply, Polynt-Reichhold, United Initiators, Windsor Fiberglass

IN THE NEWS (ONLINE / PRINT)

‘Why folding is important to the field of architecture’ on Archinect, May 08, 2019
Mentioned in ‘Composites 2019: A multitude of markets’ within CompositesWorld Magazine, January 01, 2019
Foldable composites research mentioned in CompositesWorld Magazine, November 16, 2018
Research featured in CompositesWorld Magazine, September 12, 2017
Podcast interview with CompositesWorld Magazine, September 07, 2017
Fiberglass arch featured on Archinect, September 05, 2017
Fabrication process featured on Archinect, July 11, 2017

Previous Research Project: **Robotically carved, mathematically defined, stone structures** (2015 - 2016)

Industry Collaborators: Quarra Stone Company in Madison, WI (Jim Durham, Alex Marshall, Brian Smith)
Arup in Los Angeles, CA (Bruce Danziger, Allan Olson)

Previous Creative Explorations: **Inhabitable drawing installations** (2012 - 2013)

Installations: Boundaries (2012), Boundaries 02 (2013), Line 01 (2013)

IN THE NEWS (ONLINE)

Line 01 (drawing) featured on Archinect and Bustler, October 21, 2013
Boundaries 02 (drawing) featured on suckerPUNCH, February 02, 2013
Boundaries 02 (drawing) featured on Archinect and Bustler, January 24, 2013
Boundaries (drawing) featured on suckerPUNCH, March 12, 2012
Article written about installation on Designboom Magazine, March 01, 2012
Boundaries (drawing) featured on Archinect and Bustler, February 07, 2012

PATENT

Invention: *Foldable Composite Structures*

Inventor: Joseph Choma

United States Patent Application Publication No. US 2019/0315045 A1 was published on October 17, 2019

Non-provisional application for U.S. Letters Patent bearing U.S. Serial No. 16/381,653 filed in the U.S. Patent and Trademark Office on April 11, 2019

Provisional application for U.S. Letters Patent bearing U.S. Serial No. 62/655,978 filed in the U.S. Patent and Trademark Office on April 11, 2018

Foldable composite structures and methods for fabricating foldable composite structures are provided. For example, a method comprises selectively applying a rigidifying substance to a sheet of composite material to define a plurality of hinges; allowing the rigidifying substance to cure; and folding the sheet of composite material along the hinges to form the composite structure. As another example, a method comprises laying out flat a sheet of composite material; masking a plurality of hinges on the sheet; applying a polymer to a sheet face; curing the polymer; removing the masking; and folding the sheet along the hinges to form the composite structure. An exemplary foldable composite structure comprises a planar sheet of composite material folded to define a plurality of surface segments and a plurality of hinges. A portion of the hinges form peaks and the remainder of the hinges form valleys. The hinges are defined between adjacent surface segments.

AUTHORED BOOKS

The Philosophy of Dumbness by Joseph Choma

Paperback: 140 pages, 55 illustrations, 7in x 9in, ORO Editions (October 2020)
ISBN: 978-1-951541-37-8 (pbk)

This is the dumbest smart book on contemporary architecture. What really is this “technology” that we speak of? How do we define “intelligence”? These are just two of the questions that this book attempts to answer through the unconventional (and seemingly ironic) lens of “dumbness.” Historical examples in science, art, and architecture ground “dumbness” as a means to convey a trajectory to practice “smarter.” Instead of a singular authoritative vision, over fifty contributors answer the question, “What is the dumbest, but smartest thing you’ve done?” These unique responses provide a vivid lens into the culture of contemporary architecture and the rigor behind it.

Contributors include (in alphabetical order): Hitoshi Abe, Masoud Akbarzadeh, Anthony Ames, M. Wesam Al Asali, Cecil Balmond, Stefan Behnisch, Ben van Berkel, Marlon Blackwell, Michael Boucher, Michelle Chang, Brandon Clifford, Bruce Danziger, Allison Dring, Jefferson Ellinger, Mark Foster Gage, Sean Godsell, Fabio Gramazio, Herb Greene, Patrick Harrop, Steven Holl, Coy Howard, Joyce Hwang, Florian Idenburg, Dominique Jakob, Jae Kyung Kim, Ted Krueger, Jeannette Kuo, Roberto de Leon, Jing Liu, Carl Lostritto, Winy Maas, Brendan MacFarlane, Brian MacKay-Lyons, Marc Manack, Jürgen Mayer H., Rahul Mehrotra, Michael Meredith, Catie Newell, William O’Brien Jr., Caroline O’Donnell, Ross Primmer, Philippe Rahm, Michael Ramage, Gilles Retsin, David Riebe, Siobhan Rockcastle, Jonah Ross-Marrs, Curtis Roth, Hilary Sample, Patrik Schumacher, Robert Silance, Kivi Sotamaa, Joseph Tanney, Nader Tehrani, Dimitra Tsachrelia, Julia Watson, Mark West, Chris Williams

Études for Architects by Joseph Choma

Hardcover and paperback: 270 pages, 190 illustrations, 234mm x 156mm, Routledge (May 2018)
ISBN: 978-1-138-63223-3 (hbk), ISBN: 978-1-138-63224-0 (pbk), ISBN: 978-1-315-20837-4 (ebk)

Organized around a series of pedagogical exercises, this book provides a visual journey through a series of games architects can play as a means to design. Aimed specifically at beginner design students, learning objectives include: computational thinking and making, introduction to design as an iterative, reflective, and rigorous process, ideas of continuity and discontinuity, and understanding the bias and constraints of analog and digital tooling. The text is simple and straightforward to understand and in addition the author draws explanatory diagrams to elaborate on each exercise’s description. He also includes visually compelling student work to provide insight into the possibilities of each exercise. Finally, the book includes eighteen case studies from Europe, the USA, Mexico, and Asia to inspire and inform.

REVIEWS

"This book offers a critical alternative to oppositional thinking by providing a rule-based intellectual construct through which many generative and representational media are able to converse. In a world that has already

internalized computational potentials and imperatives, this book helps to demystify the apparent complexities of technical procedures by bringing a renewed focus on the conceptual."

-Nader Tehrani (Dean and Professor, Irwin S. Chanin School of Architecture at The Cooper Union)

"*Études for Architects* is a timely manual for simplifying complexity in geometric and parametric form/space making. Here analog and digital techniques are presented as of equal value in establishing a rule-based design process that encourages speculation and innovation. The how to and why approach is generously illustrated with exemplary student work (drawings and models) and supported by contemporary building case studies that move us from the abstract to possible realities. A must have operational guide for students, teachers, and designers for generating elegance in form."

-Marlon Blackwell, FAIA (E. Fay Jones Distinguished Professor at the University of Arkansas)

"Albers grounds art and design education in ongoing experience – 'To start out by "playing" develops courage, leads in a natural manner to an inventive way of building and furthers . . . [design] discovery.' Choma's études do the same with equal if not greater force for today's design studio – with computers and, I am delighted to add, without. This is a marvelous achievement."

-George Stiny (Professor of Design and Computation at the Massachusetts Institute of Technology)

IN THE NEWS (ONLINE)

Interview published on Archinect, August 8, 2018

Morphing: A Guide to Mathematical Transformations for Architects and Designers by Joseph Choma

Hardcover: 232 pages, 886 illustrations, 220mm x 220mm, Laurence King Publishing (January 2015)
ISBN: 978-1-78067-4-131 (hbk)

Cylinders, spheres and cubes are a small handful of shapes that can be defined by a single word. However, most shapes cannot be found in a dictionary. They belong to an alternative plastic world defined by trigonometry: a mathematical world where all shapes can be described under one systematic language and where any shape can transform into another.

This visually striking guidebook clearly and systematically lays out the basic foundation for using these mathematical transformations as design tools. It is intended for architects, designers, and anyone with the curiosity to understand the link between shapes and the equations behind them.

Digital companion website and tool: www.morphingbook.com

Morphing Tool, designed and developed in collaboration with Xiaoji Chen (User Experience Designer, Microsoft)

REVIEWS

"While the classic platonic shapes have a dictionary definition, the rise of parametric design has seen an infinity of new plastic mathematical forms around that have yet to be named. Joseph Choma, who graduated in computation at MIT, has thoughtfully managed not only to name but to ontologically order them into 13 mathematical 'transformations', so that seemingly random 3D forms can be broken down into their constituent parts. As if that isn't enough he also provides the trigonometric equations that define those transformations. This is a technical tome less for those thinking traditionally about 'form follows function' and more for those that think 'form follows $f(x)$ '"

-Jan-Carlos Kucharek (Senior Editor, Royal Institute of British Architects Journal)

"Architectural design books that tackle the tough problem of the relationship of mathematics to architecture are few and far between. Even less frequent are those titles written in a clear and concise manner that then makes them easy to use.

The relation of geometry to design was introduced by writers like Matila Ghyka. Mario Salvadori, best known for his books on structures, delved broadly into the theme of *Mathematics in Architecture*. Years later, *Architectural Geometry*, furthered this discussion with a textbook by Helmut Pottmann, Andreas Asperl, Michael Hofer and Axel Kilian on geometric computing and its uses in architectural design.

Less wordy and much simpler in format, *Morphing: A Guide to Mathematical Transformations for Architects and Designers* addresses trigonometry as a tool in architectural design. As visual learners, architects think in images not formulas, making *Morphing* an ideal resource . . . easy to use and a real asset for the architectural designer."

-Barbara Opar (Architecture Librarian, Syracuse University Libraries)

IN THE NEWS (ONLINE / PRINT)

Five page book review in Journal of Mathematics and the Arts, October 24, 2016

Book review in Architectural Record, December 01, 2015

Book review in Architecture NZ Magazine, August 21, 2015
Book review in ARLIS/NA, July 25, 2015
Book review in RIBA Journal, May 13, 2015
Featured on RPI Alumni News, May 06, 2015
Book featured on ArchDaily, March 23, 2015
Book featured on Archinect, March 20, 2015
Interview published on Archinect, March 10, 2015
Book featured on suckerPUNCH, February 16, 2015

AWARDS

2019–20 NCCR Digital Fabrication Researcher in Residence, **Awarded: \$10,000**

The National Centre of Competence in Research (NCCR) Digital Fabrication is Switzerland's initiative to lead the development and integration of digital technologies within the field of architecture. The NCCR Digital Fabrication Researcher in Residence is intended to support costs associated with travel to ETH Zurich. The primary purpose of the residency is to support international collaborations with research groups at the ETH Zurich.

2018–19 Pennell Award for research and design building, **Awarded: \$22,062**

Research Proposal: *Paper Folding to Foldable Composites*
PI (100%): Joseph Choma, Clemson University

Best Presentation Award, 2018 Sidney Sussex Graduate Conference, University of Cambridge, UK

Presentation: *Paper Folding to Foldable Composites*

2013 Emerging Voices Award from the AIA Atlanta

Each year, the AIA Atlanta and Young Architects Forum of Atlanta recognizes one architect/designer in Atlanta.

IN THE NEWS (ONLINE)

Featured on suckerPUNCH, February 02, 2013
Featured on Archinect and Bustler, January 24, 2013

SMALL GRANTS

Clemson Architectural Foundation Grant, Fall 2019, **Awarded: \$2,250**

Clemson Architectural Foundation Grant, Fall 2016, **Awarded: \$1,500**

Council for the Arts at MIT "Special" Director's Grant, Spring 2011, **Awarded: \$1,000**

Council for the Arts at MIT Grant, Spring 2010, **Awarded: \$2,000**

Council for the Arts at MIT Grant, Fall 2009, **Awarded: \$2,000**

NATIONAL RESEARCH COMPETITION

Composites in Architecture Design Challenge, ACMA, Spring 2017, **First Place**

A national competition presented by the American Composites Manufacturers Association (ACMA).
Research Project: *Manifold: Expanding the possibilities of composites manufacturing through folding*
Role: Faculty Advisor / Principal Investigator
Students: Caleb Roberts, Sarah Pyne, Tyler Rodgers, Christian Bravo, Brent Sosebee, and R.J. Wilson

IN THE NEWS (ONLINE)

Compared to a new technology on Composites World Magazine, October 30, 2017
Complete story on Newsstand at Clemson University, May 22, 2017
Featured on Composites World Magazine, May 10, 2017
Featured on Composites Manufacturing, May 08, 2017
Featured on Innovation in Textiles, April 28, 2017
Featured on Inside Composites, April 28, 2017
Featured on Building Enclosure Magazine, April 27, 2017

Composites in Architecture Design Challenge, ACMA, Spring 2017, **Third Place**

A national competition presented by the American Composites Manufacturers Association (ACMA).
Research Project: *Columns of Double Curvature: Integrating weaving into ruled surfaces*
Role: Faculty Advisor / Principal Investigator
Students: Harrison Polk, Diego Bazzani, Heather Kimbrell, Erin Doering, Will Franzreb, and Carrie Bull

PAPERS (BLIND PEER REVIEWED)

Choma, Joseph. 'Sketching with Mathematics.' *Virtual + Actual: Process and Product of Design* (Design Communication Association), 2018: 308–315.

The paper was one of only nine papers (out of 154 submissions) to received a perfect peer reviewed score by all three blind peer reviews.

Choma, Joseph. 'Foldable Composites for Architectural Applications.' *Origami 7, Volume 1: Design, Education, History, and Science*, 2018: 135–150.

The *Origami 7* book was published by Tarquin Publishing as a proceedings from the 7th International Meeting on Origami in Science, Mathematics and Education (7OSME) at the University of Oxford, UK (Mathematical Institute and Department of Engineering Science).

Choma, Joseph. 'Structural Sculpting: A Designer's Approach to Robotically Carved Stone Structures.' *2018 Proceedings of the Symposium on Simulation for Architecture and Urban Design*, 2018: 197–204.

Choma, Joseph. 'Objects to Atmosphere.' *Material Vocabularies (International Journal of Interior Architecture and Spatial Design, Volume 4*, 2016): 22–25.

23% acceptance rate

Choma, Joseph. 'Boundaries 02.' *BLUR d3:dialog (International Journal of Architecture and Design*, 2016): 137–142.

Choma, Joseph. 'Digital Fabrication + Hand Craft.' *SIGRADI 2010 Proceedings*, 2010: 146–149.

Cited within five papers

INVITED PUBLICATIONS

Choma, Joseph. 'Contested Boundaries: Crafting Texture.' *Performative Materials in Architecture and Design*. Chicago: University of Chicago Press, 2013: 158–159.

Invited by Rashida Ng (Associate Professor, Temple University) and Sneha Patel

Choma, Joseph. 'T-H-I-C-K-E-N-I-N-G.' *Mathematics: From the Ideal to the Uncertain (The Cornell Journal of Architecture 9*, 2012): 191–199.

Invited by Caroline O'Donnell (Director of M.Arch. Program, Cornell University)

IN THE NEWS (ONLINE)

Journal featured on ArchDaily, June 06, 2013

Choma, Joseph. 'Contested Boundaries: Packing Instability.' *Testing to Failure*. SA+P Press, 2011: 158–159.

Invited by Nader Tehrani (Head of the Department of Architecture, Massachusetts Institute of Technology)

Choma, Joseph. 'Contested Boundaries: Material Translation.' *Machinic Processes Architecture Biennial Beijing 2010 Students Catalog*. 2010

One of four projects selected to represent MIT in the Architectural Biennial Beijing.

PROJECTS PUBLISHED (BLIND PEER REVIEWED)

Choma, Joseph. 'Paper Folding to Foldable Composites.' *ACADIA 2019 Projects Catalog*, 2019: 80–85

Choma, Joseph. 'Sketching with Mathematics: Variations of a Pavilion.' *Order; Disorder (Scroope Cambridge Architecture Journal Issue 27*, 2018): 155–158.

Choma, Joseph. 'Contested Boundaries.' *ACADIA 2010 Projects Catalog*, 2010: 146–149

Choma, Joseph. 'Exploding Volume Packing' *RUNE Journal 31*, 2010: 33

The MIT Journal of Arts and Letters showcases vault packing drawing.

PROJECTS PUBLISHED WITHIN INTERNATIONAL MAGAZINES (PRINT)

Design Exchange Magazine, UK, Wide Eyed, 90–91, August 2009

Video exhibited at the *VISIONS Beyond Media Festival* in Florence was mentioned.

eVolo Magazine, USA, Architecture Redefined, 144–145, July 2009

Design machine housing concept published.

Plan Magazine, Ireland, "Is the new Frank Gehry on..."; 89–91, September 2007

Article previewed on the cover of the magazine. Brief interview and showcased two images of a design project.

PROJECTS INCLUDED IN OTHER PUBLICATIONS

Glimpse, Clemson University's magazine of research and creative discovery, Page 67, Fall 2015

Introducing Joseph Choma to the Clemson community.

Design for the Children Book, Play and Order, Page 40, May 2010

Competition entry for a pediatric clinic in East Africa was published.

EMPAC OPEN Book, Architecture and Design Exhibition, 60–61, Fall 2008

Exhibit design published in this small promotional book.

Rensselaer Magazine, 2008 EOY Award, Page 53, Fall 2008

Winning built chair design shown in an article.

Rensselaer Magazine, Change the World Challenge Begins, Page 9, Fall 2005

The five winners of a university wide competition were mentioned.

Rensselaer Magazine, Students Design Homes for Haiti, Page 5, Winter 2004

Winners of the student design competition were mentioned.

PUBLIC ART INSTALLATION

Lowry Hall Courtyard, Clemson University, Clemson

Chakrasana, August – September 2017

Designer / Principal Investigator: Joseph Choma

Fabrication Team: William Marshall, Claire Hicks, Sarah Nail, Joe Scherer

IN THE NEWS (ONLINE)

Chakrasana featured on Archinect, September 05, 2017

Fabrication process featured on Archinect, July 11, 2017

SOLO EXHIBITIONS

951 Boylston Street Lobby, Boston Architectural College, Boston

Architecture + Mathematics, November 2015 – February 2016

Barbara Archer Gallery, Atlanta

Object to Atmosphere, January – March 2013

IN THE NEWS (ONLINE)

Boundaries 02 (drawing) featured on suckerPUNCH, February 02, 2013

Boundaries 02 (drawing) featured on Archinect and Bustler, January 24, 2013

Architecture Exhibition Gallery, Southern Polytechnic State University, Marietta

Boundaries, January – February 2012

IN THE NEWS (ONLINE)

Boundaries (drawing) featured on suckerPUNCH, March 12, 2012

Article written about installation on Designboom Magazine, March 01, 2012

Boundaries (drawing) featured on Archinect and Bustler, February 07, 2012

Emerging Technologies Gallery, MIT Museum, Cambridge

Design for an Ideal Polling Booth, April – May 2010

Funded in part by two Council for the Arts at MIT Grants
Part of the 2010 Cambridge Science Festival

IN THE NEWS (ONLINE)

Interviewed on the Cambridge Science Festival Blog, April 20, 2010
Featured on MIT's homepage (www.mit.edu), *Today's Spotlight*, March 28, 2010

INVITED GROUP EXHIBITIONS

Civil and Environmental Engineering, Stanford University

Soft Boundary [4x4]: A Critical Look at Architectural Research, September 2019

Nicholls & Clarke Lofts, 3/10 Shoreditch High Street, London, UK

ARCSOC Summer Show 2018 (University of Cambridge), July 2018

Miller Institute for Contemporary Art, Carnegie Mellon University, Pittsburgh

Designing the Computational Image/Imagining Computational Design, September - November 2017

IN THE NEWS (ONLINE)

Featured on CreativeApplications, November 21, 2017

Promenade Building, Atlanta

Southern Fried Supernova, October 2013

IN THE NEWS (ONLINE)

Line 01 (drawing) featured on Archinect and Bustler, October 21, 2013

Michael C. Carlos Museum at Emory University, Atlanta

Veneralia: Night of the Black Jaguar, May 2012

Swan Coach House Gallery, Atlanta

Architects as Artists, January – February 2012

Works, San José

Iraqi Memorial, November – December 2011

Project Space, The Elizabeth Foundation for the Arts, New York

Iraqi Memorial, September – October 2011

Department of Architecture, Massachusetts Institute of Technology, Cambridge

MIT 150, DCG Exhibit: Things to Think with, April – May 2011

Funded in part by a Council for the Arts at MIT "Special" Director's Grant

McCormick Gallery, Boston Architectural College, Boston

Build Boston, Change/Order Exhibit, November – December 2010

798 Space, Beijing, China

4th Architectural Biennial Beijing 2010, Machinic Processes, October 2010

Sheppard Fine Arts Gallery, University of Nevada, Reno

Iraqi Memorial, February – March 2010

Protospace, Bangalore, India

Spirited Caravans, Re-imagining Bangalore's Outdoors, July 2009

ARTWERX Gallery, Brighton, UK
architectuREdefined, February 2009

GROUP EXHIBITIONS (PEER REVIEWED)

School of Architecture, University of Texas at Austin
ACADIA 2019's Peer Reviewed Exhibition, October 2019

AIA Conference on Architecture 2017, Orlando
Composites Pavilion, April 2017

IN THE NEWS (ONLINE)

Featured on Composites World Magazine, May 10, 2017
Featured on Composites Manufacturing, May 8, 2017
Featured on Innovation in Textiles, April 28, 2017
Featured on Inside Composites, April 28, 2017
Featured on, Building Enclosure Magazine, April 27, 2017

McCormick Place Lakeside Center, Chicago
The Future of Composites in Construction | JEC Group, June 2017

School of Architecture, Pratt Institute, Brooklyn
ACADIA 2010's Peer Reviewed Exhibition, October 2010

Tyler School of Art, Temple University, Philadelphia
Input_Output Exhibition, October – November 2010

Stazione Leopolda, Florence, Italy
VISIONS Beyond Media Festival, Wide Eyed, July 2009

INVITED LECTURES

Invited lecture at Kennesaw State University, Marietta
Foldable Structures and Materials, February 21, 2020

Spring 2020 Lecture Series, School of Architecture and Design, New York Institute of Technology
Foldable Structures and Materials, February 11, 2020

Invited lecture at the Theory of Condensed Matter Group at the University of Cambridge, UK
Foldable Structures and Materials, December 16, 2019

Invited lecture at Kieran Timberlake, Philadelphia
Foldable Structures and Materials, August 6, 2019

Keynote Speaker for Fab15 - Collectively Independent in ElGouna, Egypt
Foldable Structures and Materials, July 30, 2019

Invited lecture at the Institute of Technology in Architecture, ETH Zurich
Foldable Structures and Materials, March 20, 2019

Keynote Speaker for the first FAB (Future of Architecture and Building) Biennale in Mumbai, India
Foldable Structures and Materials, December 2, 2018

Glaucio Paulino's Origami Engineering Seminar, Georgia Institute of Technology, Atlanta
Foldable Structures and Materials, November 27, 2018

Mechanical Engineering Department's Seminar Series, Clemson University
Foldable Structures and Materials, November 16, 2018

Sasa Zivkovic's Digital Fabrication Seminar, Cornell University, Ithaca
Materializing Mathematics, October 31, 2017 (Skype lecture)

Composites World Magazine, Denver
CW Talks explores foldable composites with Joseph Choma, July 27, 2017 (Podcast interview)

Aidan Ackerman's Generative Design Course, Boston Architectural College, Boston
Designing an Understanding, November 4, 2015

Fall 2014 Lecture Series, School of Architecture, Georgia Institute of Technology, Atlanta
Designing an Understanding, November 7, 2014

IN THE NEWS (ONLINE)

Lecture promoted on suckerPUNCH, October 31, 2014

The Computation Group Forum, Massachusetts Institute of Technology, Cambridge
Designing an Understanding, October 24, 2013

Museum of Design Atlanta's Field Trip Series, Barbara Archer Gallery, Atlanta
Object to Atmosphere, March 7, 2013

Spring 2012 Lecture Series, Dept. of Architecture, Southern Polytechnic State University, Marietta
Boundaries, January 23, 2012

The Computation Group Forum, Massachusetts Institute of Technology, Cambridge
Designing Pedagogy, November 4, 2011

Takehiko Nagakura's Design Scripting Course, Massachusetts Institute of Technology, Cambridge
For Loops, March 3, 2011

2010 Cambridge Science Festival, MIT Museum, Cambridge
Design for an Ideal Polling Booth, April 25, 2010

CONFERENCE PRESENTATIONS (BLIND PEER REVIEWED)

DCA 2018, Department of Design & Environmental Analysis, Cornell University, Ithaca
Sketching with Mathematics, October 9, 2018

7OSME, Mathematical Institute and Department of Engineering Science, University of Oxford, UK
Foldable Composites for Architectural Applications, September 5, 2018

SimAUD2018, Faculty of Architecture and the Built Environment, Delft University of Technology, Delft
Structural Sculpting: A Designer's Approach to Robotically Carved Stone Structures, June 6, 2018

2018 Sidney Sussex Graduate Conference, University of Cambridge, UK
Paper Folding to Foldable Composites, February 17, 2018

Computational Design: Practices, Histories, Infrastructures, Carnegie Mellon University, Pittsburgh
Sketching with Mathematics: Variations of a Dancing Torus, October 7, 2017

ACADIA 2010, School of Architecture, The Cooper Union, New York
Contested Boundaries, October 23, 2010

Input_Output Symposium, Tyler School of Art, Temple University, Philadelphia
Contested Boundaries, October 8, 2010

MIT DesComp 2010 Symposium, Massachusetts Institute of Technology, Cambridge
Exploding: Vault Packing, February 6, 2010

CONFERENCE PANEL DISCUSSIONS

Divergence in Architectural Research, Georgia Institute of Technology, Atlanta
Closing Panel, forthcoming March 6, 2020

Panel includes: Lydia Kallipoliti (Cooper Union), Tarek Rakha (Georgia Tech)

American Society for Cybernetics 2017 Conference, Salem

A Conversation about Design and Designing with a Conversation, August 11, 2017

Chaired and organized the panel, which was a tribute to Ranulph Glanville

Panel included: Mark Goulthorpe (MIT), Patrick Harrop (Laurentian University), Ted Krueger (RPI),

Nathan Felde (Northeastern), Daisy Ames (Columbia)

INTERNATIONAL DESIGN COMPETITIONS

Pamphlet Architecture 33 Competition, Princeton Architectural Press, Spring 2012, **Shortlisted Entry**

Nominated by a previous Pamphlet Architecture author.

Design for the Children Competition, AIA Seattle, Spring 2009, **Notable Entry**

Sustainable, culturally responsive, pediatric clinic for East Africa.

Lead Designer, collaborated with Satoshi Kiyono, Eric Tan, Amy Latten, Josh Everard and Matt Gineo

The Porous City, Spring 2009, **Finalist**

Mobile cultural space in Bangalore, India. One of the fifteen finalists.

Iraqi Memorial, Spring 2009, **Top Juror's Selection**

"Metaphorical references to inflection, wind, and erosion are important to this artist's interventionist mark making. Inflexion would be an elegant scar on the surface of the earth that recalls the land-based practices of Dennis Oppenheim, Robert Morris, and Robert Smithson. Inflexion refers to the power of man to effect change, while suggesting that such alteration is also subject to natural forces beyond human control."

-Ann Wolfe (Curator of Exhibitions and Collections, Nevada Museum of Art)

eVolo 07 Housing Competition, Summer 2007, **Special Mention**

Considered one of the most prestigious digital architecture ideas competitions in the world.

184 projects from 36 different countries entered.

OTHER DESIGN COMPETITIONS

Polling Booth Competition, Harvard GSD, Fall 2008, **Selected Project**

"Conceptually it acknowledges that the act of voting is a fiercely individual act, and the defensive structure serves to define a personal space/zone around the voter. I find the structure interesting from a formal and tectonic point view. Its center of gravity is high, and it necessarily 'stands' off the ground, on the thin support of tapered quills. I like the 'bed of nails' structural principle- whereby it stands because of the multiple improbable supports rather than a few obvious structural ones."

-Eric Howeler (Associate Professor, Harvard University)

Collab Design Competition, Philadelphia Museum of Art, Fall 2008, **Third Place**

Designed and prototyped a bench for the museum. Awards presented by Frank Gehry.

Rensselaer Final Project Competition, Fall 2008, **Second Prize**

Annual internal competition for fifth year architecture students at RPI.

Bedford Traveling Fellowship, Summer 2008, Traveled to Tokyo, Kiyoto, Osaka

Selected to study the contemporary presence of the master builder - collaborations between engineers and architects in Japan. Visited the offices of SANAA, Toyo Ito, Arata Isozaki, Mutsuro Sasaki, Takenaka Corporation, and Arup | Tokyo.

EOY Design Competition, Spring 2008, **Overall Winner**

Designed and fabricated a chair out of 1,000 ft of ethernet cable for CXtec.

Change the World Challenge Ideas Competition, Fall 2005, **Best Idea**

Collapsible disaster relief shelter. One of five students awarded within the entire university (RPI).

Haiti 8 x 8 x 40 Design Competition, Fall 2004, **Best Overall Design**

A school in Haiti constructed out of shipping containers. Winning design was built in Haiti. Equal collaboration with Jason Beam, Elise DeChard and Elyse Spink.

STUDENTS' AWARDS

2018 Juried Design Communication Exhibition, Cornell University, Ithaca

A national student competition organized by the Design Communication Association (DCA). The drawings were exhibited at the Martha Van Rensselaer Gallery at Cornell University in October 2018. Clemson University students within Joseph Choma's studio won two of the six student categories.

Observation Drawing Undergraduate Category Award

Drawing by student, Zach Gill within Joseph Choma's studio.

Observation Drawing Undergraduate Foundations Category Award

Drawing by student, Everett Zuraw within Joseph Choma's studio.

PROFESSIONAL SERVICE

Journal of Design Communication

Member of the Editorial Board, May 2020

Member of a committee that selected 15 out of 154 submissions for publication

SimAUD2020, Institute of Architectural Sciences, TU Wien in Vienna, Austria

Member of the Scientific Committee, February 2020

Reviewed four paper submissions

ACADIA 2019, School of Architecture, University of Texas at Austin

Member of the Scientific Committee, June 2019

Reviewed five paper submissions

DeSForM 2019: MIT Design Lab, Massachusetts Institute of Technology, Cambridge

Member of the Scientific Committee, March 2018

Reviewed two paper submissions

SimAUD2019, School of Architecture, Georgia Institute of Technology, Atlanta

Member of the Scientific Committee, December 2018

Reviewed four paper submissions

ACADIA 2018, Architecture Department, Universidad Iberoamericana, Mexico City

Member of the Scientific Committee, June 2018

Reviewed four paper submissions

3rd Annual Composites in Architecture Design Challenge, ACMA

Competition Juror, May 2018

Author of Competition Brief, January 2018

Wrote competition brief for the 3rd Annual Composites in Architecture Design Challenge, a national competition presented by the American Composites Manufacturers Association (ACMA). Additionally, was a juror for the competition. Participating schools included: Cornell University, Carnegie Mellon University, Penn State University, Ohio State University, Pratt Institute and Syracuse University.

SimAUD2018, Faculty of Architecture and the Built Environment, Delft University of Technology, Delft

Member of the Scientific Committee, January 2018

Reviewed five paper submissions

ACADIA 2017, School of Architecture + Planning, Massachusetts Institute of Technology, Cambridge
Member of the Scientific Committee, June 2017
Reviewed seven paper submissions

2nd Annual Composites in Architecture Design Challenge, ACMA
Organizer of Workshop and Kick-off Event, January 2017
Clemson University hosted the workshop for other participating schools at CU-ICAR.

ACADIA 2016, Taubman College of Architecture, University of Michigan, Ann Arbor
Member of the Scientific Committee, May 2016
Reviewed five paper and project submissions

WORKSHOP

DigitalFUTURES WORLD: Architects Unite, Tongji University, Shanghai, China
Materializing Mathematics, June 27 – July 3, 2020
Seven day free online workshop taught to graduate students from around the world.

Is Doing Architecture, Doing Research?, Kennesaw State University, Marietta
Introduction to Mathematical Form-Making, February 22, 2020
Three hour workshop taught to undergraduate thesis students.

Computational Design: Practices, Histories, Infrastructures, Carnegie Mellon University, Pittsburgh
Introduction to Mathematical Form-Making, October 8, 2017
Three hour workshop taught to graduate students, PhD students and several faculty.

INFORMAL WORKSHOPS AND DEMONSTRATIONS (OUTREACH)

2015 Artisphere, Greenville
Design with Mathematics, May 8–10, 2015
Interacted with between 200-300 middle/elementary school students.

2015 Cambridge Science Festival, MIT Museum, Cambridge
Architecture + Mathematics, April 24, 2015

PRIOR EXPERIENCE

Acconci Studio, July 2009 - August 2009, Designer
Ted Krueger, November 2008 - August 2009, Research Collaborator
Experimental Media and Performing Arts Center, May 2008 - October 2008, Curator / Designer
Gage Clemenceau Architects, March 2008, Facade Researcher
Acconci Studio, May 2007 - August 2007, Intern Designer
Carlos Zapata Studio, May 2006 - August 2006, Intern

GUEST CRITIC

The Bartlett, University College of London
Massachusetts Institute of Technology
Georgia Institute of Technology
Rensselaer Polytechnic Institute
University of Oregon
University of North Carolina at Charlotte
Savannah College of Art and Design
Kennesaw State University
Tuskegee University
Clemson University