Joseph Choma / Design Topology Lab / www.designtopology.com

Joseph Choma is the founder of the Design Topology Lab, an interdisciplinary design research practice. His research interests lie at the intersection of perception, computation, epistemology and pedagogy. He is the author of *MORPHING: A Guide to Mathematical Transformations for Architects and Designers* (Laurence King Publishing, 2015). Joseph completed his graduate studies in design and computation at the Massachusetts Institute of Technology. Currently, he teaches within the School of Architecture at Clemson University. In 2013, he was awarded the Emerging Voices citation by AIA Atlanta for his contribution to the field of architecture through research and experimentation.

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
Master of Science in Architecture Studies, Design and Computation, 2011
(Full Tuition Merit Scholarship / GPA 5.0)

Rensselaer Polytechnic Institute, Troy, NY
Bachelor of Architecture, Minor in Studio Arts, 2009
(Rensselaer Medalist)

PROFESSIONAL

Design Topology Lab, May 2009 - Present, Founder
"...the first research practice dedicated to the ontology of space defined by mathematics."
-Archinect.com, August 18, 2011

DRAWING EXPERIMENTS / INSTALLATIONS (Recent Works)
Point 01 (New drawing experiment in progress)
Line 01, 6' x 8', Promenade Building in Atlanta, GA, 2013
Boundaries 02, 16' x 20', Barbara Archer Gallery in Atlanta, GA, 2013
Boundaries 01, 26' x 13', SP_ARC Gallery in Marietta, GA, 2012

INDUSTRIAL DESIGN / PRODUCTS (Recent Work)
The Spiral, a new fruit bowl typology (Work in progress / prototype phase)

Acconci Studio, July 2009 - August 2009, Designer
Ted Krueger, November 2008 - August 2009, Research Collaborator
Experimental Media and Performing Arts Center, May 2008 - October2008, 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

ACADEMIC

Clemson University, July 2014 - Present
Assistant Professor of Architecture (Tenure-Track), June 2015 - Present
Visiting Lecturer, School of Architecture (Full-Time), July 2014 - May 2015

COURSES
Architectural Foundations 1, Fall 2014, 2015 (Core design studio)
Architectural Foundations 1 Laboratory: Digital Tooling, Fall 2014, 2015 (Core lab)
Visualization and Representation (Required M.Arch. course), Fall 2015
Architectural Foundations 2, Spring 2015 (Core design studio)
Architectural Foundations 2 Laboratory: Digital Tooling 2, Spring 2015 (Core lab)

SERVICE
STEAM Task Force, Fall 2014 - Present
Faculty and Student Advisory Committee (Second Year Faculty Representative), Fall 2015 - Present
Member of the Interdisciplinary Academic Team, developing a STEAM Ecosystem in SC, Fall 2015 - Present
On the doctoral committee of Mostafa Hashem, Spring 2015 - Present

Southern Polytechnic State University, July 2011 - May 2014
Assistant Professor of Architecture (Tenure-Track)

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

> COURSES
> 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
>
> SERVICE
> Invited Guest Critic to various graduate architecture and art reviews.

AUTHORED BOOKS

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

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

REVIEW

"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)

IN THE NEWS (ONLINE)
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, Mark 08, 2015
Book featured on suckerPUNCH, February 16, 2015

INVITED PUBLICATIONS (PEER REVIEWED)

Performative Materials in Arch. and Design, University of Chicago Press, Page 158-159, August 2013

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

Cornell Journal of Architecture Issue 9: Mathematics, *T-H-I-C-K-E-N-I-N-G*, Page 191-199, March 2013

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

> **IN THE NEWS (ONLINE)**
> Journal featured on ArchDaily, June 06, 2013

Testing to Failure, SA+P Press, *Contested Boundaries*, Page 158-159, October 2011

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

Machinic Processes Architectural Biennial Beijing 2010 Students Catalog, October 2010

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

PAPERS (PEER REVIEWED)

International Journal of Interior Arch. + Spatial Design, *Objects to Atmospheres*, Forthcoming 2015

> 23% acceptance rate - Paper accepted and submitted

SIGRADI 2010 Proceedings, *Digital Fabrication + Hand Craft*, Page 146-149, November 2010

> Paper has been quoted/cited by Jonathon Anderson (Assistant Professor, University of Nevada, Las Vegas) and Ming Tang (Assistant Professor, University of Cincinnati) in their paper, *Crafting Soft Geometry* for the SIGRADI 2014 Conference.

CATALOGS (PEER REVIEWED)

ACADIA 2010 Catalog, *Contested Boundaries*, Page 146-149, October 2010

> Research on *Packing Instability* and *Crafting Texture* published.

RUNE Journal 31, *Exploding Volume Packing*, Page 33, May 2010

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

PROJECTS PUBLISHED WITHIN INTERNATIONAL MAGAZINES

Design Exchange Magazine, UK, *Wide Eyed*, Page 90-91, August 2009

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

eVolo Magazine, USA, *Architecture Redefined*, Page 144-145, July 2009

> Design machine housing concept published.

Plan Magazine, Ireland, *"Is the new Frank Gehry on..."*, Pages 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

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*, Page 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.

SOLO EXHIBITIONS

951 Boylston Street Lobby, Boston Architectural College, Boston
Morphing, November - 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 MIT Council for the Arts, Grant
> 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

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 MIT Council for the Arts , "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, England
architectuREdefined, February 2009

GROUP EXHIBITIONS (PEER REVIEWED)
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
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

Professor 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

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

CONFERENCE PRESENTATIONS AND PANEL DISCUSSIONS (PEER REVIEWED)
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

INFORMAL WORKSHOPS AND DEMONSTRATIONS (OUTREACH)
2015 Artisphere, Greenville
Design with Mathematics, May 8-10, 2015

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

HONORARY AWARD
2013 Emerging Voices Award from the AIA Atlanta
      Each year, the AIA Atlanta and Young Architects Forum of Atlanta recognize one architect/designer in Atlanta.

PROFESSIONAL INTERNATIONAL 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.

Iraq 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.

STUDENT 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 (Assistant 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.

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

> Selected to study the contemporary pressence 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.

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.

GUEST CRITIC

University of North Carolina at Charlotte, CriticalMASS Graduate Research Symposium, Spring 2015
University of North Carolina at Charlotte, Kelly Carlson-Reddig's BArch Studio, Final Review, Fall 2014
University of North Carolina at Charlotte, Jefferson Ellinger's BArch Studio, Midterm Review, Fall 2014
Clemson University, Armando Montilla's MArch Studio, Midterm Review, Spring 2014
Rensselaer Polytechnic Institute, All Second Year BArch Studios, Final Review, Spring 2013
Georgia Institute of Technology, Volkan Alkanoglu's MArch Studio, Midterm Review, Spring 2013
Rensselaer Polytechnic Institute, Francis Bitonti's BArch Studio, Final Review, Fall 2012
Clemson University, Armando Montilla's MArch Studio, Penultimate Review, Fall 2012