

Daniel Cardoso Llach

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Education

2012 PhD. in Architecture: Design and Computation.
Massachusetts Institute of Technology, Cambridge, US.
School of Architecture and Planning. Presidential Fellow.

2007 Master of Science in Architectural Studies (SMArchS): Design and Computation. Massachusetts
Institute of Technology, Cambridge, US.
School of Architecture and Planning. Best Thesis Award.

2001 Professional Bachelor of Architecture.
Universidad de los Andes, Bogotá, Colombia.

Academic Appointments

Faculty Positions

2019- Associate Professor in Architecture: Computational Design at Carnegie Mellon University School of
Architecture, Pittsburgh, US.

2016-19 Assistant Professor in Architecture: Computational Design at Carnegie Mellon University School of
Architecture, Pittsburgh, US.

2015-16 Special Faculty in Architecture: Computational Design at Carnegie Mellon University School of
Architecture, Pittsburgh, US.

2012-15 Assistant Professor in Architecture: Design Computing at Penn State Department of Architecture,
University Park, US.

2002-05 Instructor in Architecture, Universidad de los Andes, School of Architecture and Design, Bogotá,
Colombia.

Fellowships and
Scholarly Visits

2016 Visiting Scholar at the Martin Centre for Architectural and Urban Studies, Department of Architecture,
University of Cambridge, Cambridge, UK. Jan-Aug.

2016 Research fellow at the Institute for the Advanced Study of Media Cultures of Computer Simulation
(MECS), Leuphana Universität, Lüneburg, Germany. Apr-May.

Teaching
Assistantships

2006-12 MIT School of Architecture and Planning, Design and Computation Group, Digital Design and
Fabrication Group, Mobile Experience Laboratory. Cambridge MA, US.

2001-02 Universidad de los Andes, School of Architecture and Design Research Center (CIFAD), Bogotá,
Colombia.

Refereed Publications

Books

2023 **Daniel Cardoso Llach** and Theodora Vardouli. *Designing the Computational Image, Imagining
Computational Design* (Applied Research and Design, 2023).

2015 **Daniel Cardoso Llach** *Builders of the Vision: Software and the Imagination of Design* (New York and
London: Routledge, 2015).

- Special Issues 2024 Pablo Herrera, Paula Gomez, Pedro Soza, and **Daniel Cardoso Llach** (eds). *International Journal of Architectural Computing (IJAC)*, "Critical Appropriations," Special Issue: SIGraDi, March 2024.
- 2022 **Daniel Cardoso Llach**, ed. *Art/Tech Relocations*, Proceedings of the ACM on Computer Graphics and Interactive Techniques. Vol. 5, No. 4. <https://dl.acm.org/toc/pacmccgit/2022/5/4>
- 2020 **Daniel Cardoso Llach** and Andrés Burbano, eds. *Other Computations*. Special Issue of Dearq, Vol. 27, 2020. <https://revistas.uniandes.edu.co/toc/dearq/27>
- 2010 Rafael Villazón, **Daniel Cardoso Llach**, and Leonardo Parra, eds. *SIGraDi 2010: Proceedings of the 14th Congress of the Iberoamerican Society of Digital Graphics* (Uniandes, 2010).
- Journal Articles 2024 (Under Review) Yuning Wu, Emek Erdolu, Jiaying Wei, Jean Oh, and **Daniel Cardoso Llach**. "Robot in the Loop: An Ethnography-Based Approach to Robotically-Supported Construction." In *Construction Robotics Journal*, Springer 2024.
- (Under Review) **Daniel Cardoso Llach**. "Computer-Aided Design in the United States, 1949-1980: Notes for a Historiography." In the *IEEE Annals of the History of Computing*, 2024.
- 2023 Hasey, Michael, Jinmo Rhee, and **Daniel Cardoso Llach**. "Form Data as a Resource in Architectural Analysis: An Architectural Distant Reading of Wooden Churches from the Carpathian Mountain Regions of Eastern Europe." *Digital Creativity*, (April 30, 2023): 1–24. <https://doi.org/10.1080/14626268.2023.2201281>.
- 2021 **Daniel Cardoso Llach**. "Between Form and Information: Early Philosophies of Computer-Aided Design." *Nexus Network Journal* 23, no. 4 (December 1, 2021): 933–43. <https://doi.org/10.1007/s00004-021-00581-w>
- Daniel Cardoso Llach** and Nida Rehman. "Magical Modernism: Latin American Urbanisms and the Imaginary of Social Architecture." *Dearq*, January 14, 2021. <https://doi.org/10.18389/dearq29.2021.06>.
- 2020 Liu, Jingyang, Yi-Chin Lee, and **Daniel Cardoso Llach**. "Computational Design and Fabrication of Highly Customizable Architectural Space Frames: Making a Flat-Cut Weaire-Phelan Structure." *International Journal of Architectural Computing*, August 21, 2020, 1478077120949033. <https://doi.org/10.1177/1478077120949033>.
- Daniel Cardoso Llach** and Andrés Burbano. "Other Computations: Digital Technologies for Architecture from the Global South." *Dearq*, no. 27 (July 10, 2020): 6–19. <https://doi.org/10.18389/dearq27.2020.01>.
- Lee, Yi-Chin and **Daniel Cardoso Llach**. "Hybrid Embroidery: Exploring Interactive Fabrication in Handcrafts." *Leonardo* 53, no. 4 (July 1, 2020): 429–33. https://doi.org/10.1162/leon_a_01931.
- 2019 **Daniel Cardoso Llach** and Mine Ozkar. "Cultivating the Critical Imagination: Post-Disciplinary Pedagogy in a Computational Design Laboratory." *Digital Creativity* 30, no. 4 (October 2, 2019): 257–76. <https://doi.org/10.1080/14626268.2019.1691604>.
- 2017 **Daniel Cardoso Llach** and Robin Forrest. "Of Algorithms, Buildings and Fighter Jets: A Conversation with Robin Forrest." *Arq: Architectural Research Quarterly* 21, no. 1 (March 2017): 53–64. <https://doi.org/10.1017/S1359135517000173>.
- Andrew Viny, Avanti Dabholkar, and **Daniel Cardoso Llach**. "Two Design Experiments in Playful Architectural Adaptability." *Nexus Network Journal* (July 11, 2017): 1–15. <https://doi.org/10.1007/s00004-017-0350-z>.
- Daniel Cardoso Llach**, Ardavan Bidgoli, and Shokofeh Darbari. "Assisted Automation: Three Learning Experiences in Architectural Robotics." *International Journal of Architectural Computing (IJAC)* 17 (March 1, 2017): 87-102. <https://doi.org/10.1177/1478077117691627>
- 2015 **Daniel Cardoso Llach**. "Software Comes to Matter: Towards a Material History of Computational Design," *DesignIssues* 31, no. 3 (Summer 2015): 41–55, https://doi.org/10.1162/DESI_a_00337.
- 2012 **Daniel Cardoso Llach**. "Esclavos Perfectos: Breve Historia de La Ciber-Arquitectura en MIT (1959-1967)." *Dearq*, no. 10 (August 2012): 48–59. <https://doi.org/10.18389/dearq10.2012.07>.

- 2011 **Daniel Cardoso Llach.** "Inertia of an Automated Utopia: Design Commodities and Authorial Agency 40 Years after the Architecture Machine." *Thresholds*, no. 39 (July, 2011): 39–44. https://doi.org/10.1162/thld_a_00158.
- 2010 **Daniel Cardoso Llach.** "Shift+Design: Scripts and Other Design Artifacts." *International Journal of Architectural Computing* 8 (January 1, 2010): 17–28. <https://doi.org/10.1260/1478-0771.8.1.17>.
- 2009 **Daniel Cardoso Llach** and Remei Capdevila Werning. "Arquitectura, diseño y computación." *Dearq* 1, no. 4 (2009): 136–40. <https://doi.org/10.18389/dearq4.2009.17>.
- Book Chapters 2021 **Daniel Cardoso Llach.** "Sculpting Probabilistic Spaces: Brief History and Prospects of Machine Learning in Design." In *The Routledge Companion to Artificial Intelligence in Architecture*, 1st ed. Routledge, 2021.
- 2019 **Daniel Cardoso Llach.** "Tracing Design Ecologies" in *DigitalSTS: A Handbook and a Fieldguide*, ed. Janet Vertesi and David Ribes, (Princeton University Press: 2019). <https://doi.org/10.2307/j.ctvc77mp9.33>
- 2018 **Daniel Cardoso Llach.** "Data as Interface: The Poetics of Machine Learning in Design" in *Machine Learning – Medien, Infrastrukturen und Technologien der Künstlichen Intelligenz*, eds. Christoph Engemann and Andreas Sudmann ([transcript-verlag]).
- 2017 **Daniel Cardoso Llach.** "Architecture and the Structured Image" in *Imagery in the Age of Modelling: Operative Artifacts in the Design Process in Architecture and Engineering*, ed. Sabine Ammon and Inge Hinterwaldner (Springer: 2017). https://10.1007/978-3-319-56466-1_2
- 2010 **Daniel Cardoso Llach.** "Scripts in the Architecture Studio," in *Computational Constructs: Architectural Design, Logic and Theory*, ed. Josh Lobel and Shouheng Cheng (Shanghai: 2010) 180–90.
- Refereed Conference Proceedings 2024 (Under Review) Yuning Wu, Jiaying Wei, Jean Oh, and **Daniel Cardoso Llach.** "Towards Human-Centered Construction Robotics: An RL-Driven Companion Robot for Contextually Assisting Carpentry Workers." 2024 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS). IEEE, 2024.
- (Under Review) Isaac Martinotti, Felicia Luo, Federica Joe Gardella, David Troetschel, and **Daniel Cardoso Llach.** "A Multi-scalar and Multi-modal Approach to Architectural Heritage Documentation: An Interactive Digital Representation of the St. Nicholas Chapel." In *The Future of Heritage Science and Technologies: The International Conference Florence Heri-Tech 2024*, Florence, Italy, April 29-30, 2024, Proceedings. Springer, 2024.
- 2021 **Daniel Cardoso Llach,** Eric Kaltman, Emek Erdolu, and Zachary Furste. "An Archive of Interfaces: Exploring the Potential of Emulation for Software Research, Pedagogy, and Design." Proceedings of the ACM on Human-Computer Interaction 5, no. CSCW2 (October 18, 2021): 294:1-294:22. (Special methods recognition.) <https://doi.org/10.1145/3476035>
- 2020 Fang, Zhihao, Yuning Wu, Ammar Hassonjee, Ardavan Bidgoli, and **Daniel Cardoso Llach.** "Towards a Distributed, Robotically Assisted Construction Framework." In *Distributed Proximities* (Association for Computer Aided Design in Architecture, ACADIA, Virtual, 2020). https://papers.cuminacad.org/data/works/att/acadia20_320.pdf
- Burgess, Cameron, Maayan Albert, **Daniel Cardoso Llach,** and Dan Lockton. Stamper: An Artboard-Oriented Creative Coding Environment. In *CHI EA '20: Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems*. <https://doi.org/10.1145/3334480.3382994>
- Daniel Cardoso Llach,** Jingyang (Leo) Liu, and Yi-Chin Lee. "Algotecton." In ACM SIGGRAPH 2020 Art Gallery, 455–56. SIGGRAPH 2020. New York, NY, USA: Association for Computing Machinery, 2020. <https://doi.org/10.1145/3386567.3388563>
- Ulberg, Erik, Daragh Byrne, and **Daniel Cardoso Llach.** "Hand-Crafting Neural Networks for Art-Making." In *Proceedings of the 11th International Conference on Computational Creativity (ICCC'20)*, 508–11. Coimbra (Virtual), 2020. <http://computationalcreativity.net/iccc20/papers/168-iccc20.pdf>
- 2019 Bidgoli Ardavan, Eunsu Kang, and **Daniel Cardoso Llach.** "Machinic Surrogates: Human-Machine Relationships in Computational Creativity." In *Proceedings of the 25th International Symposium on Electronic Arts (ISEA)*, 153–59. Seoul, Korea, 2019. <http://arxiv.org/abs/1908.01133>

- Rhee, Jinmo, **Daniel Cardoso Llach**, and Ramesh Krishnamurti. "Context-Rich Urban Analysis Using Machine Learning: A Case Study in Pittsburgh, PA." In *The 37th Conference on Education and Research in Computer Aided Architectural Design in Europe*, 343–52. Porto, 2019. https://doi.org/10.5151/proceedings-ecaadesigradi2019_550.
- Daniel Cardoso Llach**, and Javier Argota Sánchez-Vaquerizo. 2019. "An Ecology of Conflicts: Using Network Analytics to Explore the Data of Building Design." In *Computer-Aided Architectural Design. "Hello, Culture,"* edited by Ji-Hyun Lee, 198–212. Communications in Computer and Information Science. Springer Singapore.
- Daniel Cardoso Llach**, and Scott Donaldson. "An Experimental Archaeology of CAD: Using Software Reconstruction to Explore Early Computer-Aided Design Technologies." In *Hello, Culture (CAAD Futures*, Daejeon, Korea, 2019). https://10.1007/978-981-13-8410-3_8
- Argota Sánchez-Vaquerizo, Javier, and **Daniel Cardoso Llach**. "The Social Life of Small Urban Spaces 2.0." In *Hello, Culture (CAAD Futures*, Daejeon, Korea, 2019). https://10.1007/978-981-13-8410-3_21
- Ferrando, Cecilia, Niccolo Dalmasso, Jiawei Mai, and **Daniel Cardoso Llach**. "Using Machine Learning to Analyze Architectural Traditions." In *Hello, Culture (CAAD Futures*, Daejeon, Korea, 2019).
- 2018 Lu Han and **Daniel Cardoso Llach**. "Ludi: A Concurrent Physical and Digital Modeling Environment." In *Learning, Adapting, Prototyping (Association for Computer-Aided Architectural Design Research in Asia Conference - CAADRIA*, Beijing, China, March 2018).
- 2016 **Daniel Cardoso Llach**, Ardavan Bidgoli, and Shokofeh Darbari. "Of Hands and Robots: Creativity and Learning in Architectural Robotics Pedagogy." In *Creating a Sustainable Ecosystem for Making in Education (FabLearn Conference*, Stanford University, 2016).
- Avanti Dabholkar and **Daniel Cardoso Llach**. "Biometrically-Responsive Architecture: Mapping Biometric Data to Dynamic Spatial Change." In *Architecture In-Play International Conference Proceedings (Architecture In-Play*, Instituto Universitario de Lisboa, 2016).
- Andrew Viny and **Daniel Cardoso Llach**. "[Yours]: Distributing Design Agency through Multi-Modal Interactors." In *Architecture In-Play International Conference Proceedings (Architecture In-Play*, Instituto Universitario de Lisboa, 2016).
- Vina Rahimian, Lisa Lulo, and **Daniel Cardoso Llach**. "Participatory Energy Management in Building Networks." In *The First International Symposium on Sustainable Human-Building Ecosystems Proceedings (Carnegie Mellon University*, 2015).
- 2015 Ardavan Bidgoli and **Daniel Cardoso Llach**. "Towards a Motion Grammar for Robotic Stereotomy." In *Emerging Experiences in the Past, Present and Future of Digital Architecture (Association for Computer-Aided Architectural Design Research in Asia - CAADRIA*, Kyungpook National University, Daegu, Republic of Korea. 2015).
- 2014 **Daniel Cardoso Llach**. "Aedificatoria Binaria: On the Cold War Invocation of Alberti's Ghost." In *What's the Matter: Materiality and Materialism at the Age of Computation (ENHSA, EAAE, COAC*, Barcelona, Spain, 2014).
- Daniel Cardoso Llach** et al. "Acacia: A Simulation Environment for the Design and Analysis of Highly Responsive Building Facades." In *Proceedings of the 5th Annual Symposium on Simulation for Architecture and Urban Design - SimAUD (Tampa, FL, 2014)*: 193-200.
- Seoug Oh, Veronica Patrick, and **Daniel Cardoso Llach**. "Typologies of Interaction in Architectural Space." In *Proceedings of the 5th Annual Symposium on Simulation for Architecture and Urban Design - SimAUD (Tampa, FL, 2014)*: 65-72.
- 2009 **Daniel Cardoso Llach**, Avni Argun, Dimitar Dimitrov, and Qi Ai. "Drawing Transparencies: Responsible Responsiveness in Spaces Through Organic Electrochromism." In *Computation: The New Realm of Architectural Design (eCAADe Conference*, Istanbul, Turkey, 2009): 83–88.
- Daniel Cardoso Llach**. "Generative Craft: A Brief Critical Inquiry into Design Automation and Design Automata." In *From Modern to Digital: The Challenges of a Transition (SIGraDi Conference*,

Universidade Presbiteriana Mackenzie, Sao Paulo, 2009): 288-290,
http://cumincades.scix.net/data/works/att/sigradi2009_948.content.pdf.

- 2008 **Daniel Cardoso Llach.** "Design and the Automated Utopia: Certain Assumptions in Digital Design Culture." In *What Matters? Proceedings of the First International Conference on Critical Digital*, (Critical Digital Conference, Harvard University, 2008).
- Daniel Cardoso Llach** and Lawrence Sass. "Generative Fabrication." In *Proceedings of the Third International Conference on Design Computing and Cognition* (Design Computing and Cognition '08, GeorgiaTech, Atlanta: Springer, 2008): 713–32, http://dx.doi.org/10.1007/978-1-4020-8728-8_37.
- 2007 **Daniel Cardoso Llach.** Dennis Michaud, and Lawrence Sass. "Soft Façade: Steps into the Definition of a Responsive Facade for High-Rise Buildings." In *Predicting the Future* (eCAADe Conference, Frankfurt, 2007): 567–73.
- Lawrence Sass, Dennis Michaud, and **Daniel Cardoso Llach.** "Materializing a Design with Plywood." In *Predicting the Future* (eCAADe Conference, Frankfurt, 2007): 629-636.
- 2006 **Daniel Cardoso Llach.** "Controlled Unpredictability: Constraining Stochastic Search as a Form-Finding Method for Architectural Design." In *Proceedings of the 10th Iberoamerican Congress of Digital Graphics* (Sigradi Conference, Santiago de Chile, Chile, 2006): 263-267.
- Unpublished conference presentations 2021 **Daniel Cardoso Llach.** "An Experimental Archaeology of Computer-Aided Design: Reconstructing, Emulating, and Speculating with Design Technologies. ICAM Conference: International Confederation of Architecture Museums. Online. September 8.
- 2020 **Daniel Cardoso Llach,** "Reconstruction, Emulation, Speculation: Methodological Provocations into the Sociotechnical History of Computer-Aided Design." In *Locating and Timing Matters: Significance and Agency of STS in Emerging Worlds* — Society for Social Studies of Science Annual Meeting, Prague, August 18, 2020
- Daniel Cardoso Llach.** "City as Software: Designing the 'Civil-Industrial Complex' at Carnegie-Tech, 1969-1975." In History of Science Society Conference, Virtual Forum, October 6, 2020.
- Daniel Cardoso Llach** and Andrés Lombana Bermudez. "Paisajes Distantes." In International Conference of Computational Creativity ICC3'20, Coimbra (Virtual), September 7-11, 2020.
- 2019 **Daniel Cardoso Llach.** "Design and STS: Challenges and Opportunities for Pedagogy in a Post-Disciplinary Laboratory," (*Innovations, Interruptions, Regenerations* – Society for Social Studies of Science Annual Meeting, New Orleans, LA, September 4, 2019.)
- Daniel Cardoso Llach.** "Software as Narrative, City as Syntax," (*Innovations, Interruptions, Regenerations* – Society for Social Studies of Science Annual Meeting, New Orleans, LA, September 4, 2019.)
- 2018 **Daniel Cardoso Llach.** "Architectural Scientists in the Steel City: Computing Urban Form at Carnegie Mellon's Institute for Physical Planning, 1968-1974." (Society for the History of Science Conference, SHOT, Seattle, WA, Nov. 3, 2018).
- 2017 **Daniel Cardoso Llach.** "Plexes and Patches: Ambivalent Artifacts of Computer-Aided Design." In organized panel "The Valence of Misplaced Concreteness" in *STS (In)Sensibilities* (4S: Society for the Social Studies of Science, Boston, September 2017).
- Daniel Cardoso Llach.** "Software Comes to Matter: An Episode in the Material History of Computational Design." In *Command Lines: Software, Power and Performance* (Meeting of the Special Interest Group Computers, Information and Society SIGCIS, Computer History Museum, Mountain View, CA, March 18-19 2017).
- 2016 **Daniel Cardoso Llach.** "Between Automated Utopia and Augmented Practice: Steve Coons's CAD, and the early future of Computational Design." In *Disciplines in Transition* panel (3 Societies Meeting, Edmonton, Canada, June 2016).
- 2014 **Daniel Cardoso Llach.** "The Architect's Bargain: Building the Bilbao Effect in the Abu Dhabi Desert." In *Industries of Architecture: Relations, Process, Production* (Industries of Architecture Conference, University of Newcastle, Newcastle, UK, 2014).

- 2013 **Daniel Cardoso Llach.** "Design Conflicts: Visualizing Collective Agency in BIM." In *4S Annual Meeting* (4S: Society for the Social Studies of Science, San Diego, CA, 2013).
- Daniel Cardoso Llach.** "Seeking a Lingua Franca: Images of Building Information Modeling." In *Operative Artifacts: Imagery in the Age of Modeling Conference* (University of Basel, Switzerland, 2013).
- 2010 **Daniel Cardoso Llach.** "The Poetics of Automation: Conceptions of Human and Non-Human Agency in Design." In *4S Annual Meeting* (4S: Society for the Social Studies of Science, University of Tokyo, 2010).
- 2009 **Daniel Cardoso Llach.** "New Geography of Design." In *European Conference of Computation and Philosophy* (IACAP, Barcelona, 2009).
- 2008 **Daniel Cardoso Llach** and Takehiko Nagakura. "The Melnikov Grammar." In *3A International Conference of Computer Graphics and Artificial Intelligence* (Athens, 2008). Not presented in person.
- 2004 **Daniel Cardoso Llach.** "Information Surfaces: Architecture as a multimedia practice." In *COVIRARQ* (Caracas, Venezuela, 2004). Not presented in person.
- Poster Sessions 2018 Javier Argota Sánchez-Vaquerizo and **Daniel Cardoso Llach.** "Tracing Design Ecologies: A Networks Perspective." In *Eight International Conference on Design Computing and Cognition* (DCC '18, Milan, Italy, Jun 30-Jul 1 2018).
- 2017 **Daniel Cardoso Llach.** "Tracing Design Ecologies: Trees, Maps, Fields, Networks." In *4S Annual Meeting* (4S: Society for the Social Studies of Science, Boston, MA, 2017.)
http://www.4sonline.org/md17/post/tracing_design_ecologies

Other Publications

- Essays 2024 (In Press) **Daniel Cardoso Llach.** "Software Models Design." In *Are You A Model? On an Architectural Medium of Spatial Exploration*. Eds. Anna-Maria Meister, Teresa Fankhänel, Lisa Beißwanger, Chris Dähne, Teresa Fankhänel, Christiane Fülcher, Anna Schubert. Jovis. 2024.
- 2023 **Daniel Cardoso Llach.** "Seeing the Digital *from* Latin America", Foreword to the book *Homo Faber 3.0: Appropriations of Digital Fabrication from Latin America*, edited by Pablo C. Herrera, David M. Sperling, and Rodrigo Scheeren, Spring 2023.
- 2022 **Daniel Cardoso Llach.** "AI Enlivenments"; In *Reality Harvester: Nature after Data after Nature*, Skogen. Amy Boulton, Lisa Trogen Devgun, Jacob Broms Engblom, and Benj Gerdes, eds. 2022.
- Daniel Cardoso Llach.** "Art/Tech Relocations." Introduction to the ACM SIGGRAPH 2022 Art Papers.
- 2021 **Daniel Cardoso Llach.** "Unsettling Placelessness; Governing by Data; Architectural Scientists in the Steel City; Imagining Other Platforms." In *Platform Urbanism and Its Discontents*. Peter Mörtenböck and Helge Mooshammer, eds. Nai010 Publishers.
- 2020 **Daniel Cardoso Llach.** "Between Accident and Control: Contrasting Traditions of Computational Design." In *WWW Drawing: Architectural Drawing from Pencil to Pixel*, edited by Mehrdad Hadighi and Janet Abrams. Barcelona: ACTAR Publishers, 2020. <https://urbannext.net/between-accident-and-control/>
- Daniel Cardoso Llach.** "Unruly Bits." URBAN OMNIBUS - Digital Frictions series, edited by Shannon Mattern (December 4, 2019). <https://urbanomnibus.net/2019/12/unruly-bits/>
- 2018 **Daniel Cardoso Llach.** 2018. "Reconstructing 'Sketchpad' and the 'Coons Patch': Toward an Archaeology of CAD." *Leonardo* 51 (4): 429–30. <https://doi.org/10.1145/3202918.3205925>
- 2017 **Daniel Cardoso Llach** and Nida Rehman. "Functional Utopias: Interrogating Latin America's New Modernisms," *Urban Flux Architecture Magazine: The New Future of Colombian Architecture*, no 16. (2017).

	2013	Daniel Cardoso Llach. "Algorithmic Tectonics: How Cold War Era Research Shaped Our Imagination of Design.," <i>AD Architectural Design: Computation Works</i> 83, no. 2 (March 12, 2013): 16–21. https://doi.org/10.1002/ad.1546
	2012	Nida Rehman and Daniel Cardoso Llach. "The Manhattan Promenades," in <i>By the City / For the City: An Atlas of Possibility for the Future of New York</i> , 1st ed. (New York: Mult, 2012), 296–97.
Reviews	2024	Daniel Cardoso Llach. Reviewed book: "Beyond Digital: Design and Automation at the End of Modernity." <i>Journal of the Society of Architectural Historians</i> .
	2012	Daniel Cardoso Llach. "Lessons on Realarchitektur: The 'Bosque de La Esperanza' by Giancarlo Mazzanti and the Social Moment of Colombian Architecture," <i>Cuadernos de Vivienda Y Urbanismo</i> 5, no. 9 (June 2012): 142–56. Reviewed Building: "Bosque de La Esperanza" by Giancarlo Mazzanti.
	2011	Daniel Cardoso Llach. "La vanguardia es así: ansiedades paramétricas en <i>From Control to Design</i> ," <i>Dearq</i> , no. 8 (July 2011): 153–55. Reviewed Book: Michael Meredith et al., <i>From Control to Design: Parametric/Algorithmic Architecture</i> (Actar, 2008).
	2002	Daniel Cardoso Llach. "Blur: La Construcción de La Nada," <i>Piedepágina</i> , March 2005. Reviewed book: Ricardo Scofidio, <i>Blur: The Making of Nothing</i> (Harry N. Abrams, 2002).
Course books	2015	Daniel Cardoso Llach , ed. <i>Fall 2015 Thesis Studio</i> . (Carnegie Mellon University School of Architecture, 2015).
		Daniel Cardoso Llach et al. <i>Exploring Algorithmic Tectonics: A Course on Creative Computing in Architecture and Design</i> (University Park: SCDC Press, 2015).
	2010	Daniel Cardoso Llach. <i>Hello (3D) World: An Introduction to Geometry Automation using RhinoScript</i> , 2010 (Course materials for Computational Design workshops).
Catalogues and event booklets	2017	Daniel Cardoso Llach , ed. <i>Computational Design: Practices, Histories, Infrastructures</i> . Event catalogue for organized symposium at Carnegie Mellon, School of Architecture, hosted by the STUDIO for Creative Inquiry.
	2017	Daniel Cardoso Llach , ed. <i>Designing the Computational Image, Imagining Computational Design</i> . Exhibition catalogue for curated exhibition at the Miller Gallery, Carnegie Mellon University.
	2015	Daniel Cardoso Llach , ed. <i>Design Across Boundaries: An Event and a Conversation about Transdisciplinary Design Practices</i> (University Park: SCDC Press, 2015). Event catalogue for organized symposium at Penn State, Stuckeman School of Architecture and Landscape Architecture.
	2014	Daniel Cardoso Llach. <i>Responsive Architectures: A Report of the Design Ecologies Research Group</i> (University Park: SCDC Press, 2015).
Platforms		
Book Series	2017-	General editor and founder with Terry Knight of the "Routledge Research in Design, Technology and Society" book series. Titles: <i>Design for More than Human Futures</i> , Martin Tironi, Marcos Chilet, Pablo Hermansen, Carola Marín, eds., forthcoming; <i>Different Engines: Media Technologies from Latin America</i> , Andrés Burbano, 2023; <i>The Architectural Imagination at the Digital Turn</i> , Nathalie Bredella, 2022; <i>Data Publics: Public Plurality in an Era of Data Determinacy</i> , Peter Mörtenböck and Helge Mooshammer, eds. 2020; <i>The Digital Bespoke? Promises and Pitfalls of Mass-customization</i> , ginger coons, 2021; <i>Computer Architectures: Constructing the Common Ground</i> , Theodora Vardouli and Olga Touloumi, eds., 2019;

Online	2021-	Founder and editor with Theodora Vardouli of <i>lattice.space</i> , an online platform for critical and creative investigations at the nexus of design and computation. http://lattice.space
Exhibitions		
Curated	2021	"Vers un imaginaire numérique" (Towards a Digital Imaginary). Centre de Design, Université de Québec aux Montréal. With co-curator Theodora Vardouli. September-November 2021.
	2017	"Designing the Computational Image, Imagining Computational Design." Miller Gallery, Carnegie Mellon University. September-November 2017.
Work shown	2023	DumBO (Distretto Urbano Multifunzionale di Bologna). "Data is a relation, not a property" organized by Helge Mooshammer, Peter Mörtenböck, and Carmen Hines. On display: Digital artwork entitled "Lisboa Serial." May 5-26.
	2021	Venice Biennale 2021 Austria Pavilion "Platform Austria." Curated by Helge Mooshammer and Peter Mörtenböck. On display: Digital artwork entitled "Lisboa Serial."
	2020	SIGGRAPH 2020 Art Gallery, Washington DC, 17-28 August, 2020. Curated by Nik Apostolides. On display: "Algotecton" generative fabrication installation created with students and collaborators Jingyanyg Liu and Yi-Chin Lee.
		"The Architecture Machine" at Architekturmuseum der TUM, Munich, Germany. Curated by Teresa Fankhänel. On display: Interactive software reconstruction of "Sketchpad" created with Scott Donaldson and Emek Erdolu. Feb-Jun 2020.
	2019	"At the Heart of the Work: The Electronic Computer at Carnegie Mellon." Curated by Mary Catharine Johannsen. May 1-30. On display: Interactive software reconstruction of Chris Yessios' "Computer-Implemented Site Planning (CISP)" created with Harshavardan Kedia and Erik Ulberg.
	2018	"Original Narratives," SIGGRAPH 2018 Art Gallery, Vancouver, Canada, August 12-16, 2018. Curated by Andrés Burbano. On display: Interactive software reconstructions of "Sketchpad" and "Coons Patch."
		"Composites Challenge Exhibition," AIA Convention, New York, June 21-23, 2018. On display: Tutored work by students in the "Fundamentals of Computational Design" class.
	2017	"Designing the Computational Image, Imagining Computational Design." Miller Gallery, Carnegie Mellon University. September-November 2017. On display: Interactive software reconstructions of "Sketchpad" and "Coons Patch."
	2011	Future New York: Archiprix 2011 Workshop Exhibition at the Solomon R. Guggenheim Museum, 1071 5th Avenue (at 89th Street), New York, NY, Jul 7. On Display: student work from tutored Archiprix Workshop. Co-instructor: Nida Rehman.
		Future New York: Archiprix 2011 Workshop Exhibition Center for Architecture, 536 Laguardia Place, Manhattan, NY, Jul 8. On Display: student work of tutored Archiprix Workshop. Co-instructor: Nida Rehman
	2010	MACHINIC PROCESSES: Architecture Biennial Beijing 2010; 798 Space, 798, Beijing, Oct. 15 - Oct. 20, 2010; curators: Neil Leach, Xu Weiguo; on display: Tutored student work from scripting workshops in Lima, Peru, and Santiago, Chile. Co-instructors: Kenfield Griffith and John Snavely
Other contributions	2008	Voronoi Pavilion (Universidad Peruana de Ciencias Aplicadas, Lima, Perú, 2008). Scripted and digitally fabricated studio projects exhibition space. Roles: Workshop instructor, RhinoScript programmer and design consultant with lead designers Natalija Bojlsakov and Brian Miller.

Awards, Grants, Fellowships

External	2023	Endangered Wooden Architecture Programme Grant proposal: "The Endangered Hybrid-Style Wooden Folk Churches of the Carpathian Mountain Region of Ukraine." As PI. GBP \$25,000. (Awarded, but cancelled due to complications related to the Ukraine-Russia conflict.)
	2022	Manufacturing Futures Institute: Innovating Construction Through Manufacturing: A Reinforcement Learning Framework for Robotically-Supported Collaborative Modular Construction. As PI. \$83,121.
	2021	Google, Artists + Machine Learning (AMI) Research Awards 2021: Unrestricted gift in support of "Rethinking AI and Automation in Architecture" research project. \$20,000.00;
		PA Manufacturing Fellows Initiative Technical Proposal: "Innovating Construction Through Manufacturing: A Reinforcement Learning Framework for Robotically-Supported Modular Factories." As PI with Co-PI Jean Oh and industry collaborators iBUILT. \$68,541.00;
		Applied Research and Design Publisher Subvention for the book <i>Designing the Computational Image, Imagining Computational Design</i> . \$11,000;
	Kaplan Fund, Furthermore Foundation: Funds to support design and permissions for the book <i>Designing the Computational Image, Imagining Computational Design</i> . \$4,500.00.	
2019	Social Science and Humanities Research Council from Canada, Connection Grant. Funds to support the exhibition "Vers un imaginaire numérique" in Montreal, Canada, a related symposium, and a series of interactive installations. As Co-PI with PI Theodora Vardouli. CAN \$49,000.00.	
	EaaSi Microgrant sponsored by Yale University for the proposal: "Supporting Software Reconstruction and Analysis of Early Architectural Software." As PI with Co-PI Eric Kaltman. \$5,000.00.	
2017	Graham Foundation for the Advanced Study in the Fine Arts. Funds to support the exhibition "Designing the Computational Image, Imagining Computational Design." \$3,500.00.	
2016	Institute for the Advanced Study of Media Cultures of Computer Simulation (MECS), Leuphana Universität, Lüneburg, Germany. Research Fellowship. \$7,000.	
CMU	2024	Frank-Ratchye STUDIO for Creative Inquiry Steiner Guest Lecture Fund in support of of Andres Burbano's visit to CMU as part of the Spring 2024 Computational Design event series, April 30. \$500.
	2023	College of Fine Arts Research and Creativity Fund, Carnegie Mellon University. Funds to support the production of the book <i>Designing the Computational Image, Imagining Computational Design</i> . \$3,500.00
	2022	Center for Arts in Society (CAS). Support for Designing the Computational Image, Imagining Computational Design book. \$500;
		Frank-Ratchye STUDIO for Creative Inquiry. Funds to support the production of the book <i>Designing the Computational Image, Imagining Computational Design</i> . \$1,000.
	2021	College of Fine Arts Research and Creativity Fund, Carnegie Mellon University. Funds to support the production of the exhibition "Vers un imaginaire numérique." \$4,000.00;
		Frank-Ratchye STUDIO for Creative Inquiry. The Frank-Ratchye Further Fund (formerly Art @ the Frontier). Funds to support artist fees for the exhibition "Vers un imaginaire numérique." \$2,000.
2020	Isabel Sophia Liceaga Discretionary Fund, Carnegie Mellon University School of Architecture. Funds to support the development of the installation "Molecular Tectonics," selected for the SIGGRAPH Art Gallery 2020. \$2,000;	
	Frank-Ratchye STUDIO for Creative Inquiry Steiner Guest Lecture Fund in support of "The Digital Mundane" Fall 2020 Computational Design Lecture Series. \$500.	
2019	College of Fine Arts Research and Creativity Fund, Carnegie Mellon University. Funds to support the production and transport of the installation "Molecular tectonics [Algotecton]" to be exhibited in SIGGRAPH Washington DC. \$3,500.00.	

	2017	College of Fine Arts Research and Creativity Fund, Carnegie Mellon University. Funds to support the development of "Soft Reconstructions," an interactive component of the exhibition "Designing the Computational Image, Imagining Computational Design" at Miller Gallery, CMU. \$4,000.00. Berkman Faculty Development Fund, Carnegie Mellon University. Funds to support the exhibition "Designing the Computational Image, Imagining Computational Design." \$3,000.00. Isabel Sophia Liceaga Discretionary Fund, Carnegie Mellon University School of Architecture. Funds to support the symposium "Computational Design: Practices, Histories, Infrastructures." \$2,000.00.
PSU	2013	The H. Campbell and Eleanor R. Stuckeman Fund for Collaborative Design Research, Penn State. Funds in support of the development of a software system for modeling facades of variable transmittance as a step towards low-cost organic electrochromic smart facades. \$34,588.00.
MIT	2009	The MIT Council for the Arts, Massachusetts Institute of Technology. Funds in support of the 'CROMA' Project. \$1,000.00.
	2007	MIT Presidential Fellowship. Awarded full tuition and stipend for doctoral studies. Best SMArchS Thesis Award, Department of Architecture, MIT. \$500.
	2005	Tuition Support Grant, Department of Architecture, MIT; Special Merit Recognition (stipend support), Department of Architecture, MIT.
Other	1996	Andrés Bello National Award. Andrés Bello Foundation, Colombia. Granted to the Top scores nationwide on the ICFES (equivalent to the SAT in the US) test. The award included financial aid towards college tuition.
Not Awarded	2024	NASA Big Idea Competition, as part of a faculty team in support of PhD student Stella Shen, who led the development of the grant. \$100,000.
	2023	NSF Engines Proposal: in support of a multi-institutional Manufacturing and Construction "engine." One of several CMU Co-PIs with PI Pingbo Tang. 1M.
	2022	Innovating Construction Through Manufacturing: A Reinforcement Learning Framework for Robotically-Supported Collaborative Modular Construction — proposal to the Pennsylvania Agency for Economic Development in the 2022 cycle. PI.
	2021	Scott Institute Seed Grant Program. "IEQ and STEM Educational Robot." As Co-PI with PI Erica Cochran.
	2019	National Science Foundation, Innovations in Graduate Education (IGE Program) Proposal: "Re-thinking Graduate Education for Critical and Creative Technical Practice." As PI with Co-PIs Daragh Byrne and Mine Ozkar. \$499,000; Manufacturing Futures Initiative Proposal: "Computational Design and Manufacturing of Highly Customizable Interlocking Space Structures." PI with Co-PIs Jessica Zhang and Keenan Crane. \$179,834; Public-Interest Technology Challenge proposal "Cultivating Critical Technical Practitioners at the Intersection of Design, Technology, and Society. As PI with Co-PIs Molly Wright Steenson and Rosta Farzan. \$86,148.
	2018	DOE Benefit – High Performance Windows Topic. Proposal: "A Fast, Tunable and Low-Cost Dynamic Window for Improved Building Energy Performance and User Comfort." As PI with Co-PIs: Omer Karaguzel, Michael Bockstaller, and industry collaborators Giner, Inc., and Vitro Architectural Glass. \$1,393,137.00; Manufacturing Futures Initiative. "A Manufacturing Technology for Highly Responsive Organic Electrochromic Windows for Energy Efficient Buildings." \$136,392.00.
	2016	Department of Energy (DOE) Small Business Innovation Research (SBIR) and Small Business Technology Transfer (STTR) Programs. "Organic Electrochromic Windows for Energy Efficient Buildings." \$35,000.00.

- 2014 Collaborative Design Research Grant, Penn State. (As Co-PI with PI Frans Padt and Co-PI Mallika Bose). "Exploring the Role of Science in Green Design Pedagogy." \$50,000.00;
- CTSI's Innovative Approaches to Big Data Pilot Project Funding 2014. (As Co-PI with PI Darla Lindbergh). "Interactive Data Visualization Tools to Support and Transform Client-Centered Dietary Health Decision Making: A Systems Architecture Approach." \$300,000.00.
- 2012 DOE SBIR/STTR Programs Phase I Application (As Co-PI with PI Avni Argun). 2012. "Organic electrochromic windows for energy efficient buildings." \$100,000.00.

Invited Lectures

- Keynotes
- 2024 Biennale Technologia, Turin (Italy) Utopia Realista. Keynote conversation: "Costruire il futuro: l'Intelligenza Artificiale dalla teoria alla pratica." Daniel Cardoso Llach and Freddy Fortich, April 19.
- Deans of the Americas IV Conference, University of New Mexico (USA), Florida International University (FIU), ISTHMUS (Panama), and La Salle University (Pachuca, Mexico). Puebla, Mexico. "Notes on Artificial Intelligence and Architectural Education." February 23.
- 2023 Phygital Frameworks: Architecture, Technology, Human & Non-Human Society Doctoral Symposium, Taubman College, University of Michigan. "Other Computations." March 17.
- 2022 Critical Appropriations: SIGraDi (Iberoamerican Society of Digital Graphics) Annual Conference Keynote. Online. Title: "Other Computations." November 11;
- Are You A Model? Conference, TU Darmstadt. "Models and Visions: Reconstructing Early Philosophies of Computer-Aided Design." November 3;
- Virtual City and Territory International Conference, Universidad Jorge Tadeo Lozano, Bogotá and Cartagena Online. "Urban Intelligence Disorders." Sep 27.
- 2021 CAAD Futures 2021, Design Imperatives: The Future is Now, USC Los Angeles. Online. "Provincializing the digital." July 19.
- 2020 Inaugural Talk, Department of Architecture Universidad de los Andes, Bogota, Colombia. Online. "Sculpting Expressive Spaces: New Directions for Computational Design." Aug 14.
- 2017 IV Seminario de la Representación del Proyecto: Sostenibilidad y Medio Ambiente. Universidad del Valle, Cali, Colombia. Online. "Design at the Interface: Notes on Computation and Creativity." Nov 8;
- CAx: Dimensions of Computer-Aids in Architecture, Biological Sciences, Design and Medicine. Humboldt Universität zu Berlin, Germany. "Slaves, Partners, Aides: Imagining Computers in Design and Architecture." Apr 2.
- 2016 Universidad Piloto, Bogotá, Colombia. Digital Reveal Conference. "Builders of the Vision." Sep 1.
- Lecture series
- 2024 Politecnico di Torino, Turin, Italy School of Architecture. Frontier of Artificial Intelligence Series. Title of the talk: Intelligent Artifices? The Long History of Generative Design. April 18.
- 2024 Florida Atlantic University, School of Architecture Lecture Series. "Critical Reconstructions." In conjunction with *Designing the Computational Image* book launch. Feb 8.
- 2023 New York Institute of Technology, Collective Automation Symposium. "Robot in the loop: Rethinking Automation in Construction." Organized by Athina Papadopoulos. April 26;
- AIA Build PGH, Title of the talk: "Reconfigurations of Construction Automation" April 26.
- 2022 University of Pennsylvania, Weitzman School of Design. "Other Computations" talk for ARCH 807: "Architecture in the Age of Thinking Machines" course, invited by Evangelos Kotsioris. Nov. 28;
- Simon Fraser University, School of Interactive Arts and Technology. "Critical Reconstructions." Online. Organized by Gabriela Aceves Sepúlveda. March 23;

- The Bartlett, Architecture UCL, History of Computation seminar, invited by Mario Carpo. Title of the talk: "Early Philosophies of Computer-Aided Design." January 26, 2022.
- 2021 Venice Biennale 2021 midissage. In *Debates on Platform Urbanism*, panel "City on Demand? Questioning the Urbanisation of Technology Capital" organized by Austrian Pavilion curators Helge Mooshamer and Peter Mörtenbock. August 27.
- Inclusive Futures Festival, conversations on inclusivity series: Critical Computation. Talk "Cultivating the critical imagination" in conversation with Anuradha Vikram, Andrew Culp, and JoAnn Kuchera-Morin. Moderated by Gustavo Alfonso Rincon. Online. June 30.
- Digital Futures Talks. "AI Enlivenments" talk as part of "The death of culture" panel, in conversation with Sylvia Lavin, Sanford Kwinter, Neil Leach, Enrique Walker, and Ciro Najile, moderated by Marina Rodríguez das Neves. Online. March 20.
- Technical University of Munich (TUM), School of Architecture. "Gestalt versus cybernetics: Histories of digitization" panel, in conversation with Margarete Pratschke, organized by Prof. Nathalie Bredella. Online. June 16.
- TU Delft Faculty of Architecture and the Built Environment. Digital Culture Talks at the Theory of Architecture and Digital Culture group. Online. "What is design in the open data society?" Organized by Prof. Georg Vrachliotis. April 27.
- The Bartlett BPro Talks. "Rethinking AI in Architecture." Online. Organized by Prof. Mario Botazzi. Jan 19.
- 2020 Architekturmuseum der TUM speaker series linked to the exhibition "The Architecture Machine," in conversation with Philip Schneider. Talk: "Experimental archaeology of computer-aided design." Online. Nov 25.
- Ink & Switch Lunch-time Lecture: "Software reconstructions, emulations, and speculations." Online. Sep 17.
- 2019 University of Michigan, Taubman School of Architecture Lecture Series joint with the STS Department. Talk: "Working things out: Design-STs transitions from technical formalization to critical imagination." Ann Arbor, Nov 4.
- Harvard University, Graduate School of Design. Talk: "Laborious computers: making and unmaking 'perfect slaves' in the architectural imaginary" in the symposium "Other Histories of the Digital" organized by Matthew Allen, Phillip Denny, and Christina Shivers. Cambridge, MA Apr 2.
- Clemson University, Department of Architecture Lecture Series. Talk: "Design at the Interface." Clemson, Mar 27.
- University of Houston, Department of Architecture, guest lecture: "Infrastructures of the Imagination: Creative and Critical Inquiry into Computation and Design." Houston, Mar 25.
- Carnegie Mellon University, History Department, Lunch-time Lectures. Talk: "Experimental Archaeologies of CAD." Pittsburgh, Feb 20.
- 2018 Bauhaus Universität, School of Media, lecture "The calculative imagination: computation and the boundaries of design." As part of the Bauhaus Digital Masterclass organized by Christoph Engemann. Weimar, Oct. 17.
- 2017 Massachusetts Institute of Technology, Department of Architecture Lecture Series. "Designing the Computational Image, Imagining Computational Design." Cambridge, Nov 11.
- Carnegie Mellon University, Human Computer Interaction Institute (HCII) Lecture Series, Pittsburgh PA. "Design at the Interface." Pittsburgh, Oct 13.
- Leuphana Universität, Institute for the Advanced Study of Media Cultures of Computer Simulation (MECS). Perspective Rules Symposium. "To See is to Play: The Poetics of Machine Learning in Design." Lüneburg, Germany, Jan 17.

- 2016 Technical University of Munich, Munich Center for Technology and Society Lecture Series. "Cybercultures of Design and Architecture: Cross-disciplinary Origins and Prospects." Munich, Germany Jul 4.
- University of Cambridge, Department of Architecture Lecture Series, Cambridge, UK. "Computing the Architectural Imagination: Postwar Architectural Research at MIT and Cambridge." Jun 1.
- Leuphana Universität, Institute for the Advanced Study of Media Cultures of Computer Simulation (MECS) "Software and the Imagination of Design: Probes and Prospects." Lüneburg, Germany, May 10.
- Institute of Advanced Architecture of Catalunya (IAAC) Lecture Series, "Computer-Aided Revolutions: Critique of the Future." Barcelona, Spain, May 5.
- University of Cambridge, Department of History and Philosophy of Science (HPS), "Twentieth Century Visions of Design" in 20th Century Think Tank Lunch Time Lectures. Cambridge, UK, Apr 28.
- The Bartlett School of Architecture, University College London, Mario Carpo's "Digital Turn" Seminar, London, UK. "Builders of the Vision." Mar 16.
- 2015 The Bartlett School of Architecture, University College London. Material Matters Lecture Series, London, UK. "Towards a Material History of Computational Design." London, UK, May 19.
- Carnegie Mellon University School of Architecture Candidate talk, "Infrastructures of the Imagination: Creative and Critical Inquiry in Computational Design." Pittsburgh, Mar 3.
- 2014 The Bartlett School of Architecture, University College London. Computational Making Workshop at DCC Conference. "The Making of an Abstraction." London, UK, Jun 21.
- Foster and Partners Friday Lectures. "Bits Come to Matter." London, UK. Jun 20.
- 2013 Massachusetts Institute of Technology, Mobile Experience Lab Lunch Talk. Cambridge, MA. "The Design Ecologies Research group." Cambridge, MA, Nov 25.
- The Drawing Center, WWW-Drawing Symposium, "Design and Computation: Between Accident and Control." New York, NY. May 9.
- Autodesk Lunchtime Lecture Series, "Building BIM: Seeking a Lingua Franca." Waldham, MA, Jul 26.
- LA Design Week PechaKucha, "De-centering Design." Los Angeles, CA, Jun 26.
- Penn State College of Arts and Architecture Faculty Forum, "Creative work and research." State College, PA, Mar 16.
- 2012 Architectural Association AA Visiting School, "Missiles, Symbiosis and the Invention of an Algorithmic Tectonics." Bogotá, Colombia, Jun 22.
- University of Massachusetts at Amherst, School of Architecture candidate talk. "Creative Ecologies." Amherst, MA, Mar 30.
- The Pennsylvania State University, Stuckeman School of Architecture and Landscape Architecture candidate talk "Design and the Technological Imagination." State College, PA, Mar 19.
- Université Laval, Ecole d'architecture et d'aménagement candidate talk, "Design et Imagination Technologique." Quebec, Canada, Mar 15.
- The State University of New York at Buffalo, Department of Architecture candidate talk. "Design and the Technological Imagination." Buffalo NY, Feb 13.
- Lancaster University, Lancaster Institute of Contemporary Arts (LICA) candidate talk. "Design and the Technological Imagination." Lancaster, UK, Jan 27.
- 2011 American University of Sharjah Department of Architecture Reviews Week, "Geometry as Data, Data as Material." Sharjah, UAE, Apr 22.
- 2010 Universidad Francisco Marroquín, Department of Architecture Lecture Series, "Arquitectura, Tecnología y Computación." Ciudad de Guatemala, Guatemala, Sep 13.

Book Launch Events	2024	<p>(Forthcoming) SIGGRAPH 2024 Retrospectives Panel Conversation “Designing the Computational Image: A History of Computers as Creative Tools.” Daniel Cardoso Llach and Theodora Vardouli in conversation with Julián E. Gómez, Denver, CO, United States, August 1st, 2024.</p> <p>Florida Atlantic University, School of Architecture Lecture Series. <i>Designing the Computational Image</i> book launch, co-presented with Theodora Vardouli. Feb 8.</p> <p>McGill University School of Architecture, “The Computational Image.” Book launch of <i>Designing the Computational Image</i> with co-author Theodora Vardouli and conversants Rafico Ruiz, Sophian Audry, and Molly Wright Steenson. Jan 22.</p>
	2023	Carnegie Mellon University, Frank Ratchye STUDIO for Creative Inquiry. Book launch event for <i>Designing the Computational Image</i> with co-author Theodora Vardouli. Sep 27.
	2016	<p>Galería Casa Hoffman, “Builders of the Vision.” In conversation with Andrés Burbano. Bogotá, Colombia, Sep 3.</p> <p>Chelsea School of Art, University of the Arts, London (UAL). “Builders of the Vision.” In conversation with Betti Marenko. London, UK, May 5.</p>
Other speaking	2024	<p>Carnegie Mellon University, History of Science and STS group guest talk invited by Chris Phillips. March 27.</p> <p>Carnegie Mellon University, School of Architecture. Guest lecture at Ethics and Decision Making in Architecture course, invited by Valentina Vavasis. Mar 19;</p> <p>a2ry Conference Arts and AI Working Group: Participation in panel “AI Histories, Legacies, and Continuities: What is Old is New Again? Examining the Histories, Existential Threats, and Futures for Creative Practices.” Title of contribution: “Some Futures Never Get Old.” Feb 7 (Virtual).</p>
	2023	Computer History Museum; CAD Pioneers Meeting (Industry Oral History Panel with historical figures), organized & invited by David Brock. May 1-2.
	2022	<p>Carnegie Mellon University, School of Architecture. Guest talk at the Architectural Theory course invited by Kai Gutschow. Nov 7;</p> <p>Carnegie Mellon University, School of Architecture. Guest participant at faculty panel in the Situating Research course invited by Nida Rehman. Nov 4.</p>
	2021	SIGGRAPH 2021. Moderator at “Making Computer Graphics History Public” Retrospective Panel, organized by Andrés Burbano, with Alvy Ray Smith, Jacob Gaboury, Dave Kasik, Adele Newton, and Mary Whitton. https://doi.org/10.1145/3450617.3471253 .
	2020	Carnegie Mellon University, School of Architecture. Guest talk “Cultivating the critical imagination” at Architectural Theory course invited by K. Gutschow. Nov 5.
	2019	Carnegie Mellon University, School of Design. Guest talk at seminar invited by Molly Wright Steenson.
	2018	<p>University of Toronto, Department of Architecture, guest lecture in the course “Architecture and Media” invited by Prof. Pete Minosh, Toronto, Canada. Oct 14;</p> <p>Carnegie Mellon University, School of Architecture Lecture Series. Introduction to Kyle Steinfeld’s lecture. Pittsburgh, Apr 9;</p> <p>Carnegie Mellon University, Department of Philosophy, guest lecture in the “Automation, Artificial Intelligence and Society” seminar invited by Prof. Aiden Kestigian, Pittsburgh, PA. Apr 3.</p>
	2017	Oberlin College, Department of the History of Art. Seminar on Contemporary Architecture, Prof. Peter Minosh, Oberlin, OH. “Builders of the Vision.” Oberlin, Nov 17.
	2014	Penn State, Stuckeman School of Architecture and Landscape Architecture, State College PA, US. Introduction to Achim Menges’ lecture. State College, Feb 6.
	2013	MIT Media Lab. Moderator in panel with Nicholas Negroponte and members of The Architecture Machine Group in the “Futures Past: Design and the Machine” Conference, MIT. Cambridge, MA, Nov 21.

Penn State, Stuckeman School of Architecture and Landscape Architecture. Introduction to Mark West lecture. State College, PA, Feb 6.

- 2011 Massachusetts Institute of Technology Department of Architecture. "Science Vs. Storytelling" public conversation as part of the Archiprix competition. Cambridge, MA, May 6.
- 2009 Boston Architectural College class guest. "A Generative Grammar for Fabrication." Boston, Jan 8.

Selected Press

- Reviews
- 2021 Drago, Gaetano. "'Vers Un Imaginaire Numérique' Exhibition, A New Digital Language - Data Aided Design," November 13, 2021. <https://dataidedesign.com/vers-un-imaginaire-numerique-exhibition-a-new-digital-language/>.
- Beya, Christiane. "The UQAM Centre de Design Presents Vers Un Imaginaire Numérique." *Canadian Architect* (blog), September 9, 2021. <https://www.canadianarchitect.com/the-uqam-centre-de-design-presents-vers-un-imaginaire-numerique/>.
- Iwao Haraguchi. "Algotecton." *DiVA, Journal of the Society for Arts and Science* Vol. 50, 2021 Summer issue.
- 2018 Allen, Matthew. "The Computational Imagination: Review of the Exhibition 'Designing the Computational Image, Imagining Computational Design.'" *Leonardo Journal*, 2018. <https://doi.org/10.1145/3202918.3264556>.
- 2017 Smith, Greg J. "Designing the Computational Image, Imagining Computational Design – An Excavation of Digital Form." *Creative Applications Network*, November 21, 2017. [link](#)
- 2015 Pfaff, Marc. "Daniel Cardoso Llach: *Builders of the Vision: Software and the Imagination of Design*." *PLANBILDER: Medien Der Architekturgestaltung*, no. 11 (2015): 207–2012.
- Interviews
- 2022 "Reflecting on Key Themes and Research from the SIGGRAPH 2022 Art Papers." ACM SIGGRAPH Blog. Interview with Daniel Cardoso Llach. September 27. <https://blog.siggraph.org/2022/09/reflecting-on-key-themes-and-research-from-the-siggraph-2022-art-papers.html/>
- 2021 Daniel Cardoso Llach in Conversation with Gabriela Arrigoni from the "Preserving and sharing born-digital and hybrid objects from and across the National Collection" project led by the Victoria and Albert Museum (V&A) in collaboration with the British Film Institute (BFI) and Birkbeck, University of London (not public).
- 2020 Daniel Cardoso Llach in Conversation with Philip Schneider about CAD software reconstructions, Architekturmuseum der TUM, Munich (online), Nov 25. <https://www.architekturmuseum.de/en/events/daniel-cardoso-llach-in-conversation/>
- 2020 Daniel Cardoso Llach interview with Keith Hack from Virginia Tech on architectural labor, automation, and AI. Nov. 20.
- 2017 INTER-PUNCT. "In Conversation with Daniel Cardoso Llach." *Interpunct Special Issue: Exhibitions - Intermission*. November 17. <https://interpunct.pub/inter-mission-exhibitions>.
- 2016 DCRL Questions: Daniel Cardoso Llach, Centre for Digital Cultures, Leuphana Universität, Lüneburg, Germany. <https://vimeo.com/182768506>
- Articles
- 2010 MIT spotlight, "A Better Window: MIT Team Designs a Light-Controlling, Energy-Smart Facade," *Massachusetts Institute of Technology*, January 5, 2010, <http://web.mit.edu/>.
- 2009 Roberto Quevedo, "Arquitecto Cardoso Llach En La UFM," *El Amigo de La Marro*, October 6, 2010, <https://noticias.ufm.edu/arquitecto-cardoso-llach-en-la-ufm/>.

Doctoral Advising

Principal	2024	Jingyang Liu, "Space as Interface: A Computational Framework for Spatial Computing in Robotically-Assisted Construction." PhD in Computational Design, School of Architecture CMU. Jinmo Rhee, "A Computational Method for the Identification and Comparative Analysis of Urban Form Types." PhD in Computational Design, School of Architecture CMU. (expected) Yuning Wu, "A Human-Centered, Reinforcement Learning Driven Robotic Framework For Supporting Construction Workers." PhD in Computational Design, School of Architecture CMU. (expected) Emek Erdolu, "Robotic Technologies and the Reconfiguration of Building Design and Construction Work." PhD in Computational Design, School of Architecture CMU. (expected) Oscar Kang, "Adaptive Solar Control Strategies" (working title). Doctor of Professional Practice, PhD. in Computational Design, School of Architecture CMU.
	2023	Ardavan Bidgoli, "A Collaborative Framework for Machine Learning-Based Tool Making for Creative Practices." PhD in Computational Design, School of Architecture CMU.
Committee Member	2024 (expected)	Matthew Wizinski, "Design and Post-Capitalist Desire" (working title). Doctor of Design. CMU School of Design.
	2023	Diego Pinochet, "Computational Gestural Making." PhD in Architecture: Design and Computation, Department of Architecture, Massachusetts Institute of Technology;
	2022	Ayodh Kamath, "Making Information Modeling and Systems Ecology." PhD in Architecture, Weitzman School of Design, University of Pennsylvania.
	2019	Heather Ligler "The Portman Variations." Georgia Institute of Technology Department of Architecture. Atlanta, US. Victor Okhoya, "Investigating Machine Learning for Parametric Analysis and Design in Architectural Practice." Doctor of Professional Practice, PhD in Computational Design, School of Architecture CMU.
	2020	Jonathan Weston, "Seeing Beyond the Pretty Picture: Exploring the Aesthetics and Function of Architectural Visualization." University of Cambridge, Department of Architecture. Cambridge, UK.
	2019	Anne Burdick, "Designing Text Technologies for Critical Interpretation." Carnegie Mellon University, School of Design (DDes). Pittsburgh, US. Philippa Mothersill, "Towards Digital Liminality: Computational tools for 'beyond average' creative thinking." MIT Media Lab. Cambridge MA, US. Vernelle Noel, "Computational Approaches to Craft: Exploring Wire-Bending in Trinidad." Department of Architecture and Landscape Architecture, Penn State. State College, US.
	2016	Guangxuan Zhang, "Designing a Platform to deal with Conflicts in Organizations: A Design Science Project." Department of Information Sciences and Technology, Penn State. State College, US.
	2015	Michael Marcinkowski, "Data, Design, Dialogue: Hermeneutics of Socio-Technical Design." Department of Information Sciences and Technology. Penn State. State College, US.
2014	Camilo Cifuentes, "Narrativas cibernéticas y arquitectura computacional" [Cybernetic Narratives and Computational Architecture]. Escuela Técnica Superior de Arquitectura de Barcelona (ETSAB), Barcelona, Spain.	

Masters Advising

Principal	2024	Felicia Luo, "A 4D Diary Co-authored by Human and Machine: Interactively Visualize, Control, and Understand Data Collection and ML Computation within Built Environments." Master of Science in Computational Design, CMU; Steve Hu, "Bridging the Gap: Exploring a Design-via-Making Approach in Architecture through Digital Guidance Systems." Master of Science in Computational Design, CMU;
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- David Troetschel, "Reality Integrated Design: Harnessing Real-World Data for Next-Generation Virtual Environments." Master of Science in Computational Design, CMU.
- 2023 Joshua Cao, "3D Art Research with Radiance Field and Style Transfer." Master of Science in Computational Design, CMU;
- Mitchell Foo, "Designing Agents for Co-Creation in Virtual Reality with Deep Reinforcement Learning." Master of Science in Computational Design, CMU;
- Chloe Hong, "3D Design through Interactive Training of a Generative Reinforcement Learning Agent." Master of Science in Computational Design, CMU;
- Haoyu Liu, "Towards Contextualized Synthetic Dataset for Construction Sites." Master of Science in Computational Design, CMU;
- Boyang Lin (expected), "Virtual Environments and Real Places: An Exploration of Key Elements in Placemaking." Master of Science in Computational Design, CMU;
- Terrence Ou (expected), "Mobile Robot-Assisted Material Handling in Prefabricated Housing Factories." Master of Science in Computational Design, CMU;
- Bradley Williams, "Building Information Twinning: Investigating the Software Architecture of a Construction Digital Twin." Master of Science in Computational Design, CMU;
- Junjie Xu (expected), "Incorporating AI Tools with the Workflow of Design Practice: Use-cases in 2D Architecture and UX Design Practice" (working title). Master of Science in Computational Design, CMU.
- 2022 Yang Bai, "Location Based Hybrid Urban Environment for Intangible Community Heritage Protection." Master of Science in Computational Design, CMU (December);
- Zishen Wen, "Recognizable Point-Cloud: An End to End Point Cloud Processing, Visualization, and User-Interaction Design." Master of Science in Computational Design, CMU;
- Michael Hasey, "The 3-D Form Analysis of Regional Architecture Using Deep Learning: A Case Study of Wooden Churches from the Carpathian Mountains." Master of Science in Computational Design, CMU.
- 2021 Ruoqi Bai, "Interactive Mobility Prediction for Urban Transportation Space with Agent-Based Simulation." Master of Science in Computational Design, CMU (December).
- Shuyi Shao, "VR-Based Interactive Thermal Data Visualization and Performance Computing Engine for the Early Stage of Urban Residential Building Volume Design." Master of Science in Computational Design, CMU (December).
- Kexin Lu, "Encoding Hygroscopic Deformation: Design for Democratizing Water-Triggered Shape-Changing Interfaces." Master of Science in Computational Design, CMU (August).
- Maria Vlachostergiou, "The Aquaborg." Master of Science in Computational Design, CMU (August).
- 2021 Qiqin Le, "Free-form Modeling with Physical Constraint Optimization: Exploration of a Design Space." Master of Science in Computational Design, CMU.
- Michael Stesney, "Rematerializing Graphs: Learning Spatial Configuration." Master of Science in Computational Design, CMU.
- 2020 Yufei Cheng, "Data Processing in Using Machine Learning to Analyze Floor Plan Layout Design." Master of Science in Computational Design, CMU.
- Zhihao Fang, "Towards Multi-drone Autonomous Construction via Deep Reinforcement Learning." Master of Science in Computational Design, CMU.
- Siyu Guo, "A Generative Design Application Development Workflow for Architecture" Master of Science in Computational Design, CMU.
- Yun Hao, "The Responsive Layer: Steps Towards a Digital Augmentation System to Make Everyday Objects Responsive." Master of Science in Computational Design, CMU.

- Yaxin Hu, "Children's Exploration with Social Robots in Digital Art-Making." Master of Science in Computational Design, CMU.
- Yi-Chin Lee, "Hybrid Embroidery." Master of Science in Computational Design, CMU.
- Hongtao Ma, "A Mixed-Modeling Environment Exploring Tangible and Digital Interactions for Iterative Design Modeling." Master of Science in Computational Design, CMU.
- Vincent Mai, "Toward Designing with Heterogeneous Values." Master of Science in Computational Design, CMU.
- Weixin Qiu, "An Inquiry Into Crowdsourcing for Early-stage Product Design" Master of Science in Computational Design, CMU.
- Erik Ulberg, "Crafting the Weights of a Convolutional Neural Network to Make a Drawing." Master of Science in Computational Design, CMU.
- 2019 Ozgüc Capunaman, "CAM as a Tool for Creative Expression: Informing Digital Fabrication Through Human Interaction." Master of Science in Computational Design, CMU.
- Zheng Luo, "Image-Based Light Modification: A Machine-Learning Approach to 'Content-Aware' Image Processing." Master of Science in Computational Design, CMU.
- Jinmo Rhee, "Context-Rich Urban Analysis Using Machine Learning: A Case Study in Pittsburgh, PA." Master of Science in Computational Design, CMU.
- Humphrey Yang, "GeoMatries: Machine Learning-Powered Simulation for 3D Printing and Morphing Materials Design." Master of Science in Computational Design, CMU.
- Zhuoni Yang, "Modeling Computational Design: An Interactive Visual Analysis of the Field Based on Topic Modeling and Bibliometrics." Master of Science in Computational Design, CMU.
- 2018 Adie Al Nobani, "Alternative Architectural Narratives." Master of Science in Computational Design, CMU.
- Javier Argota Sánchez Vaquerizo, "What you See is What you Get: A Data-Informed Workflow in Design for Architecture and Urbanism." Master of Science in Computational Design, CMU.
- Camille Baumann-Jaeger, "Exploring How Design Perpetuates Online Harassment in Virtual Reality". Master of Science in Computational Design, CMU.
- Cecilia Ferrando, "Automating Spatial Analysis of Architectural Floorplans." Master of Science in Computational Design, CMU.
- Yuqian Li, "An Approach to Search Through Architectural Topology." Master of Science in Computational Design, CMU.
- Yingxiu Lu, "A New Shape-Finding Process Based on Conversational Genetic Algorithms." Master of Science in Computational Design, CMU.
- Atefeh Mahdavi, "Reimagining Urban Intersections Through Participatory Simulation Platforms." Master of Science in Computational Design, CMU.
- Rachael Tang, "A Collaborative Online Platform for Geo-Located Data Visualization." Master of Science in Computational Design, CMU.
- George Zhu, "Make Models Great Again: Interactively Generating Simplified Human-Editable Models from 3-D Scanned Meshes." Master of Science in Computational Design, CMU.
- 2017 Scott Donaldson, "Generating, Simulating, Interrogating: A Computational Design Thinking Framework." Master of Science in Computational Design, CMU.
- Hetian Cao, "Designing for Interaction and Insight: Experimental Techniques for Visualizing Building Energy Consumption Data." Master of Science in Computational Design, CMU.
- Lu Han, "A Concurrent Physical and Digital Modeling Environment." Master of Science in Computational Design, CMU.

		Qiaozhi Wang, "HADEN: Using Virtual Reality as an Expressive Medium for Spatial Design." Master of Science in Computational Design, CMU.
	2015	Ardavan Bidgoli, "Towards an Integrated Design-Making Approach in Architectural Robotics." Master of Science in Architecture: Design Computing. PennState.
		Vina Rahimian, "Energy Distribution Management in a Network of Intelligent Buildings as a Learning Machine." Penn State Department of Architecture. Master of Science in Architecture: Design Computing. PennState.
	2014	Seoug Oh, "Typologies of Interaction in Architectural Space." Penn State Department of Architecture. Master of Science in Architecture: Design Computing. PennState.
Committee member	2024	Yujeong Seo, "Design with data-driven shape rule recognition through learning-based shape grammar interpreter." Master of Science in Computational Design, CMU.
	2023	Linxiaoyi Wan, "Towards Adaptive Additive Manufacturing with Image-based Monitoring on Binder Jetting Printing." Master of Science in Computational Design, CMU;
		Jiaying Wei, "Responsive Robotic Assembly with Heterogeneous Raw Wood." Master of Science in Computational Design, CMU;
		Jamaal Tribune, "Computational Methods in Knit Design." Master of Science in Computational Design, CMU;
		Gregorious Budhijanto, "Robotics in Construction for Sustainable Practices." Master of Science in Sustainable Design, CMU.
	2022	Chengyu Chen, "Collaging the Landscape Histories and Constructing Memories Through Augmented Reality." Master of Science in Computational Design, CMU;
		Willa Yang, "Robotic Metamaterials: An Integrated Modular Approach for Users to Create Robotic Applications Hands-On." Master of Science in Computational Design, CMU.
	2021	Katherine Giesa, "Listening Out: Towards a New Spatial Sonic Imaginary." Master of Science in Computational Design, CMU.
		Qiao Zhang, "GitHub for Shapes: An Online Collaboration Platform Implementing Version Control for Collaborative Design." Master of Science in Computational Design, CMU.
	2020	Ian Friedman, "Rethinking PropTech: Drawing Insights About the Real Estate Technology Industry Through Technical Experimentation." Master of Science in Computational Design, CMU.
		Yixiao Fu, "Evoking the Post-industrial Landscape Memories through Mixed Reality Soundscape." Master of Science in Computational Design, CMU.
	2019	Wei Wei Chi, "3D Microscopic Texture Interface in CAD: Cultivating Material Knowledge for the Practiced Digital Hand." Master of Science in Computational Design, CMU.
		Runchang Kang, "Designing the Interactive Architecture Space: A System for Designing and Interacting with Appliances in Interactive Architecture Indoor Sensing Environment." Master of Science in Computational Design, CMU.
	2018	Manuel Rodríguez Ladrón de Guevara, "Multiresolution." Master of Advanced Architectural Design, CMU.
	2017	Dyani Robarge, "Critical Mass." Master of Advanced Architectural Design, CMU.
		Mike Jeffers, "Design Games and Machine Learning: A Method for the Application of Machine Learning in Design Environments." Master of Science in Computational Design, CMU.
	2016	Martin West, "Can Architecture Ascribe the Human Condition?" Cambridge University Department of Architecture. MPhil. Cambridge, UK.
	2014	Savia Palate, "Visualizing Famagusta's Coastline: Co-existence in a contested ghost-city." Master of Architecture: Culture, Space, and Society. PennState.

2012 Prince C. Kwabi, "Does the Management of BIM Implementation of a Project's Design Phase Require a Specialist?" Salford Institute of Technology, Manchester, UK.

Undergraduate Theses

Principal Advisor

2022 Ammar Hasonjee, "Rethinking Automation in Construction." Carnegie Mellon University School of Architecture. Bachelor of Architecture.

2016 Andrew Viny, "[YOURS]: Distributing Agency in Design Through Computation." Bachelor of Architecture, CMU.

Avanti Dabholkar, "Towards Emotive Architecture." Bachelor of Architecture, CMU.

2015 Dustin Julius, "Complexity." Bachelor of Architecture, PennState.

Courses

Associate Professor CMU

2024 MSCD Master Thesis, 48-769B (S);

2023 Inquiry into Computational Design, 48-727 (F);
 Proseminar in Computational Design, (F);
 MSCD Master Thesis, 48-769B (S);

2022 Inquiry into Computational Design, 48-727 (F);
 MSCD Pre-Thesis II, 48-716 (F);
 Rethinking Automation in Construction, 48-749 (F and S);
 MSCD Master Thesis, 48-769B (S);

2021 MSCD Pre-Thesis II, 48-716 (F);
 Inquiry into Computational Design, 48-727 (F);
 MSCD Master Thesis, 48-769B (S);
 Fundamentals of Computational Design, 62-275 (S).

2020 MSCD Pre-Thesis II, 48-716 (F);
 Inquiry into Computational Design, 48-727 (F);
 MSCD Master Thesis, 48-769B (on parental leave) (S).

2019 MSCD Pre-Thesis II, 48-716 (F);
 Inquiry into Computational Design, 48-727 (F);
 Special Topics in CD: Experimental Archaeology of CAD, 48-749 (F);
 Fundamentals of Computational Design, 62-275 (S);
 Special Topics in CD: Critical Technologies, 48-749 (S);
 MSCD Master Thesis, 48-769B (S);
 MSCD Pre-Thesis I, 48-715 (S).

Assistant Professor CMU

2018 MSCD Pre-Thesis II, 48-716 (F);
 Inquiry into Computational Design, 48-727 (F);
 MSCD Pre-Thesis I, 48-715 (S);
 Special Topics in Computational Design: Critical Technologies, 48-749 (S);
 Fundamentals of Computational Design, 62-275 (S).

2017 MSCD Pre-Thesis II, 48-716 (F);
 Inquiry into Computational Design, 48-727 (F);
 MSCD Pre-Thesis I, 48-715 (S);
 Fundamentals of Computational Design, 62-275 (S).

2016 MSCD Pre-Thesis II, 48-716 (F);
 Inquiry into Computational Design, 48-727 (F);

	2015	Fundamentals of Computational Design, 62-275 (F); Undergraduate Thesis Studio, 48-519 (F).
Assistant Professor PSU	2013-15	<i>Graduate:</i> ARCH 497C "Algorithmic Tectonics" (Spr 14, 15); ARCH 497B "Inquiry into Design Computing" (Fall 13, 14); ARCH 537A "Technology and the Imagination of Design" (Spr 14). <i>Undergraduate:</i> ARCH 231 Architectural Design I (2 nd Year Studio: Spr 13, 14, 15); ARCH 232 Architectural Design II (2 nd Year Studio: Fall 12, 13, 14).
Teaching Assistant MIT	2009-11	<i>Graduate</i> "Design Without Boundaries" (Fall 09, Spr 10 with Profs. William J. Mitchell and Federico Casalegno); "Design Scripting" (Spr 10 with Prof. Takehiko Nagakura); "PhD. Forum" (Spr 10, 12); "Inquiry into Computation and Design" (Fall 08-10) with Prof. Terry W. Knight).
Instructor Universidad de los Andes	2002-05	<i>Undergraduate:</i> "Fundamentals of Digital Media" (Spr 04, 05); "Third Year Design Studio" (Spr 05); "First Year Design Studio" (Spr, Fall 02-04).

Workshops

As Tutor	2018	Bauhaus Universität, Weimar, Germany. "Computational Design: History and Future Perspectives" lecture and one-day teaching session.
	2017	Universidad del Valle, Cali, Colombia. "Algorithmic Objects" three-day computational designing and making workshop. Nov 8-10.
	2016	University of Brighton, Brighton, UK. "Visualising Design Ecologies" at the Design Research Society (DRS) Conference, 2016. Jun 17. Co-instructor: Yanni Loukissas.
	2014	University College London, London UK. "Computational Making" at the 14 Design Computing and Cognition Conference (DCC '14), Jun 21. Co-organizers: Terry Knight, George Stiny, Theodora Vardouli, Dina El-Zafaly;
	2013	The Pennsylvania State University, University Park, PA, US. May 4. "Gestural Modeling and Interactive Architecture."
	2011	Massachusetts Institute of Technology, Cambridge, MA, US. "International Architectural Design Workshop" at the ARCHIPRIX 2011 Competition. Co-instructor: Nida Rehman; American University of Sharjah, Sharjah, UAE. "Geometry as Data, Data as Material." Co-instructors: Santino Medina and Maher El-Khaldi.
	2010	Universidad Francisco Marroquín, Ciudad de Guatemala, Guatemala. Scripting for design exploration workshop; ORG Architects, Cambridge, MA, US. Scripting for design exploration workshop; Cornell University School of Architecture, Ithaca, NY, US. Scripting for design exploration workshop. Co-instructors: Kenfield Griffith and Yanni Loukissas.
	2009	Harvard University Graduate School of Design, Cambridge, MA, US. Scripting for design exploration workshop. Co-instructors: Kenfield Griffith and Taro Narahara; Lynden High-School, Lynden, WA, US. "All Hands on Deck" workshop on basic computational geometry. With support from McNeel and Associates. Co-instructor: Kenfield Griffith;

		Universidad de los Andes, Bogotá, Colombia. Scripting for design exploration workshop. With support from McNeel and Associates. Co-instructor: Skylar Tibbits.
2008		Universidad Peruana de Ciencias Aplicadas, Lima, Perú. "Computational Design Solutions" scripting workshop. Co-instructors: Kenfield Griffith and John Snaveley;
2006		Universidad de Chile, Santiago de Chile, Chile. "Computational Design Solutions" scripting workshop in SIGRADI conference. Co-instructors Kenfield Griffith and John Snaveley.

Review and Advisory Roles

Editorial Boards	Journals	Technology Architecture + Design (TAD) Journal, 2023-present; Dearq, 2017-2023.
Conference Committees	Conferences	CAADFutures 2024- (Vice Co-Chair of the board); ACM CSCW 2024, Costa Rica, Papers Co-Chair; ACM SIGGRAPH 2022, Vancouver, Art Papers Chair; SIGRADI 2010, Bogotá, Editorial Co-chair.
Advisory boards	Projects	Building for Tomorrow Project for the Collaborative Development of Sustainable Infrastructure for Architectural and Design Documentation. Harvard University. 2020-22. https://projects.iq.harvard.edu/buildingtomorrow
Peer review	Journals	Technology and Culture, 2024; IEEE Annals of the History of Computing, 2024; Area29, 2023; ArtNodes, 2020, 2022; Proceedings of the ACM in Computer Graphics and Interactive Techniques, 2021; Science, Technology and Human Values (ST&HV), 2019, 2020; Digital Culture and Society, 2019; NTM Journal of the History of Science, Technology and Medicine, 2019; Ardeth, 2019; IJAC, 2014, 2015, 2019; Design Studies, 2015; FOOTPRINT #15, 2014; Dearq Journal, 2011, 2016, 2017, 2020, 2021.
	Conferences	ACADIA 2024; CHI 2024; ACM SIGGRAPH 2023 Art Gallery; ACM SIGGRAPH 2021 Art Papers; ACM CSCW 2019, 2020, 2024; eCAADe 2020; ACSA 2017; Re:Trace 2017; CAADRIA 2017; SIGRADI 2016; CAADRIA 2016; SIGGRAPH 2014; ACSA 2013; Futures Past 2013; ICIE 2013; SIGRADI 2012; SIGRADI 2011.
	Books	MIT Press (three book proposals and manuscripts); Routledge (two book proposals not counting the DTS book series); Springer (two book proposals).
	Expert Panels	New Frontiers in Research Fund (NFRF-FNFR) 2019; Einstein Professorship, Berlin 2018; William J. Mitchell Hackathon Jury 2015; Universidad de los Andes Faculty Grants 2013.
Other conference roles		Design, Technology and Society Track Chair DRS 2018, Limerick, Ireland; Design History Society 2016 Session chair; SIMAUD 2014 Session Chair.

Guest critic

External	2024	Daniels School of Architecture, University of Toronto, Toronto, Canada. MArch Thesis Studio. Invited by Brady Peters. April 25. Toronto, Canada;
		Peter Guo-hua Fu School of Architecture, McGill University, Montréal, Canada. Computational Drawing Studio, invited by Theodora Vardouli. January 23. Montréal, Canada.
	2023	University of Michigan, Taubman College, Department of Architecture. Guest critic for 1 st Year PhD students work, invited by Arash Adel;
		Pennsylvania State University, Stuckeman School, Architecture. Guest critic for the Lightweight Tension Structures Hybrid Final Review, invited by Felecia Davis and Farzaneh Oghazian.
	2021	Universidad de los Andes, School of Architecture and Design. Final review for graduate studio "Machine Learning and Bio-Design," invited by Andrés Burbano and Giovanna Danies. June 2;

- The Pennsylvania State University, PA. Final review for "Tension Structures" studio, invited by Felecia Davis. April 29.
- 2020 University of Buffalo, NY. Final Review for the "Situating Technologies" studio, invited by Omar Khan. May 5;
- Georgia Institute of Technology School of Architecture. Final Review of Second Year Studio, invited by Vernelle Noel. April 15;
- University of California at Berkeley, CA. Final Review for the "Drawn Together" studio, invited by Kyle Steinfeld. Mar 18.
- 2019 University of Charlotte at North Carolina, Charlotte, Georgia, US. Final Review for Arch 7211 Connective Environments 2 Studio, invited by Dimitris Papanikolaou, Apr 29.
- 2018 University of Charlotte at North Carolina, Charlotte, Georgia, US. Final Review for Thesis Studio, invited by Dimitris Papanikolaou, Apr 30;
- McGill University School of Architecture, Montreal, Canada. Final Review for the "Counterfactual History Studio" invited by Theodora Vardouli, Apr 23;
- Rice University, School of Architecture, Houston TX, US. Final Review for 1st and 2nd Year Design Studio invited by Sarah Whiting, Andrew Colopy, and Gail Chen, Apr 17-18.
- 2016 Institute for Advanced Architecture of Catalunya (IAAC), Barcelona, Spain. "Urban Workshop" Studio Midterm review invited by Tomas Diez. Mar 4.
- 2015 The Pennsylvania State University, Department of Architecture, State College PA, US. 2nd Year Architecture Studio invited by Felecia Davis. Dec 10.
- 2014 The Pennsylvania State University, Department of Architecture, State College PA, US. LARCH 312 and graduate LARCH 540 capstone design studio invited by Maria and Chris Counts, May 2.
- 2013 Harvard University Graduate School of Design, Cambridge MA, US. Final review for "The Mixed Reality City" course invited by Yanni Loukissas, Nov 22;
- The Pennsylvania State University, Department of Architecture, State College PA, US. Midterm review of 3rd Year Architecture Studio invited by Lisa lulo;
- The Pennsylvania State University, Department of Architecture, State College PA, US. Midterm Review of 1st Year Architecture Studio invited by Nida Rehman.
- 2012 Wentworth Institute of Technology Department of Architecture, Boston MA, US. Final Review of Architecture Thesis Studio invited by Zenovia Touloudi. Dec.
- 2011 American University of Sharjah Department of Architecture, Sharjah, UAE. Midterm Design Studio Reviews invited by Ginger and Michael Dossier. Oct.
- 2010 Massachusetts Institute of Technology, Cambridge MA, US. Midterm Review of 1st Year M.Arch Projects invited by Meijin Yoon;
- Wentworth Institute of Technology, Boston MA, US. 1st Year Architecture Representation Final Review invited by Carlos Cardenas;
- Pratt Institute, New York, NY. Invited by Kyle Steinfeld as a guest critic for the final review of the Summer Architecture Studio. Summer.
- 2009 Wentworth Institute of Technology, Boston MA, US. Final review of drawing and visualization course, invited by Carlos Cardenas. Spring;
- Cornell University, Ithaca, NY. Final review of Second Year Studio, invited by Yanni Loukissas. Fall.
- 2008 Wentworth Institute of Technology, Boston MA, US. Final review of Fourth Year Architecture Studio, invited by Peter Minosh. Fall;
- Massachusetts Institute of Technology, Boston MA, US. Final review of First Year Architecture Studio, invited by Andres Sevtsuk. Spring.

	2007	Boston Architectural College, Boston MA, US. Final review of Thesis Projects, invited by Marcel Botha. Spring.
At CMU	2024	Fundamentals of Computational Design Final Review, invited by Vernelle A. A. Noel. School of Architecture, May 2, 2024
		Cybernetics and Design, invited by Ensar Tamizel. School of Architecture, March 9;
	2022	Senior Studio Final Review, invited by Daniel Rosenberg. School of Design, Dec 7;
	2020	MDes Thesis Reviews, invited by Dina El-Zafaly. School of Design, Dec 18;
		Architectural Interfaces course final review, invited by Kiriaki Goti, School of Architecture, Dec 11;
		Critical Cyborg Studio final review, invited by Mary-Lou Arscott, School of Architecture, Dec 9.
	2018	Senior Studio: Service Design, invited by Molly Wright-Steenson, School of Design, May 7;
		Back2Front, invited by Mary-Lou Arscott, School of Architecture, Apr 4.
	2017	Doctor of Design (DDes) first year review, invited by Terry Irwin, School of Design, Mar 9-11;
		Grow Collective 2 nd Year Design Studio, invited by Josh Bard, School of Architecture, Dec 6;
		"THESIS IP Studio final review, invited by Mary-Lou Arscott, School of Architecture, Dec 6;
		"THESIS IP Studio mid review, invited by Mary-Lou Arscott, School of Architecture, Oct 27;
		B.Arch Thesis Studio, invited by Mary-Lou Arscott, School of Architecture, Feb 24.
	2016	"Interaction Design Studio" final review, invited by Austin Lee, School of Design, Dec 14;
		Physical Computing class review, invited by Ali Momeni, School of Art, Nov 10.
	2015	Physical Computing class review. Invited by Ali Momeni, School of Art, Dec 16;
		Emergent Media Proseminar final review, invited by Daragh Byrne, School of Architecture, Dec 12;
		3 rd Year Architecture Design Studio midterm review, invited by Dana Cupkova, School of Architecture, Oct 16;
		Thesis Final Reviews, invited by Mary-Lou Arscott, School of Architecture, April.

University Service

Carnegie Mellon	University	Budget and Financial Affairs Committee, 2021-23; Non-tenure promotion committee, 2020-21; Doctoral Mentoring Working Group 2019; Faculty Senator 2017-2019.
	Department	<i>Current</i> School Review Committee (SRC), 2022-; Chair of Computational Design MS Track, 2015-; Chair of Computational Design PhD Track, 2022-; Codirector of Computational Design Laboratory, 2015-; <i>Past</i> Watson Chair Faculty Search Chair, 2023; Computational Design Faculty Search Chair, 2022-23; Computation + Representation committee 2021-23; Visiting faculty search committee 2021;

		EX-CHANGE steering committee 2021-23; Chair of SoA Graduate Programs 2016-19;
Penn State	University	Presidential Commission for Racial and Ethnic Diversity, 2013-15.
	College	College Faculty Advisory Council, 2013; Chair of the Stuckeman Center for Design Computing (SCDC) Executive Committee, 2014-2015; Stuckeman School Director Search Committee, 2013.
	Department	Graduate Curriculum Committee 2014-15; Graduate Admissions Committee 2014; Technology Committee 2012; Design Computing Research Cluster Curriculum 2013-15; "Beehive" Faculty Advisor 2013-15.
MIT	Department	Architecture: Design and Computation graduate program Admissions Committee, 2010.
Universidad de los Andes	Department	Architecture: Publications and Media Office Digital Publications 2002-05.

Academic Events Organized

Symposia	2021	<p>"Digital.Visual.Material" virtual symposium linked to the "Vers un imaginaire numérique" exhibition. Co-organized with Theodora Vardouli. May 26-28.</p> <p><i>As Below, So Above: Surface and Depth in the Computational Image</i>, Jacob Gaboury, UC Berkeley;</p> <p><i>Materialities of Shiny Surfacing</i>, Akshita Sivakumar, UC San Diego;</p> <p><i>Your New Mnemotechnics</i>, John May, Harvard University;</p> <p><i>Designers Redesign Robotics</i>, Mario Carpo, The Bartlett;</p> <p><i>On Mathematical Aesthetics</i>, Alma Steingart (Columbia University)</p> <p><i>Processing Models, Modelling Processes for the HfG Ulm ca. 1952</i>, Anna-Maria Meister (TU Darmstadt)</p> <p><i>From Paper to Code: Episodes in the history of computer mapping in Great Britain</i>, Moa Carlsson (ESALA)</p> <p><i>Feminist Interventions in the West Coast: The case of Video Art and Computer Graphics</i>, Gabriela Aceves-Sepúlveda (Simon Fraser University)</p> <p><i>Topology, Crystals, and a Multitude of Futures</i>, David Theodore (McGill University)</p> <p><i>T-Square, Spacewar!, and Interfaces of Early Spatial Computing</i>, Ranjodh Singh Dhaliwal (UC Davis)</p> <p><i>And conversations</i> with: Leslie Mezei & Frieder Nake; Rachel Strickland & Paul Pangaro; George Stiny; Liz Van der Zaag; and Joanna Berzowska, Dana Cupkova, Vernelle Noel, and Jer Thorp.</p>
	2017	<p>"Computational Design: Practices, Histories, Infrastructures." Organizer and chair of two-day symposium at the School of Architecture, Carnegie Mellon University, Oct 6-8, hosted by the STUDIO for Creative Inquiry. Over a hundred registered attendants and the following speakers:</p> <p><i>GLO/Graphic Line Object</i>, Kristy Baillet, SCI-Arc/Ohio State;</p> <p><i>Computational Mediations and Intermediations</i>, Nathalie Bredella, Berlin University of the Arts, Germany,;</p> <p><i>Sketching with Mathematics: Variations of a Dancing Torus</i>, Joseph Choma, Clemson and University of Cambridge, UK;</p>

Indeterminate Set, Dana Cupkova, Carnegie Mellon;

Culling Vision: Depth, Distance, and the Limits of Perception in Graphical Simulation, Jacob Gaboury, Berkeley;

Human-Centered Automation; Madeline Gannon, Carnegie Mellon;

The Present and Future of Architectural Automation, Andrew Heumann, WeWork, NY;

Olympic Calculations: Computational Modeling for Munich '72, Sean Keller, Illinois Institute of Technology;

Interpolation: A Social and Personal History, Golan Levin, Carnegie Mellon;

Beyond Nostalgia: Drawing Discipline from the Brief Pen-Plotter Era, Carl Lostritto, RISD;

If these lines could talk: Extracting Patterns from Digital Archives of CAD Drawings and 3D Models Using Novel Forensic Techniques, Jonah Ross-Mars, MIT;

The New New Economy, Molly Wright Steenson, Carnegie Mellon;

Picturing Structures, Structuring Pictures: Graph Manifestations in Christopher Alexander's Architectural Theories 1967-1974, Theodora Vardouli, McGill University.

- 2015 "Design Across Boundaries." One-day Symposium and Open House at the Stuckeman Center for Design Computing, The Pennsylvania State University, May 5. Four invited speakers, open house, around one hundred attendees.
- Somnath Ray, Timescape, NY;
- Athina Papadopoulou, MIT Design and Computation;
- Laia Mogas Soldevilla, MIT MediaLab;
- Orkan Telhan, Penn Design.
- Conference sessions
- 2019 "Computation in the Core: Critical Pedagogies." Panel at the 2019 ACSA Conference "Black-Box: Articulating Architecture's Core in the Post-Digital Era," in collaboration with Matthew Allen. Pittsburgh, PA. 2019.
- 2018 "Architects and Science in the Research University." Panel at the 2018 History of Science Society conference "Telling the Stories of Science," co-organized with Theodora Vardouli.
- "Design, Technology and Society" track at the Design Research Society Conference 2018, co-organized with Terry Knight. Limerick, Ireland. Jun 25-28 2018.
- 2015 "Computing Futures: Three Episodes in the Postwar Imagination of Design." Session at the Design History Society Conference, California Center for the Arts, San Francisco, Sep 11-13.
- Lecture Series at CMU
- 2022 Computational Design Fall Lecture, co-presented with SoA's Public Programs
- Seams: Crafting an Architecture*. Felecia Davis, PennState. October 3rd.
- Computational Design Spring Lecture Series "Re-thinking, Re-making"
- Collateral Architecture*. Jordan Geiger. CMU. March 24th;
- Software Timelines: New Research into the Origins of Today's Architectural Software Culture*. Teresa Fankhänel, Independent Curator. March 29th;
- Mediating Form and Matter: From Control to Uncertainty and Back*. Benay Gursoy, PennState. April 7th;
- Formulations: Practices of Design Mathematics*. Andrew Witt, Harvard Graduate School of Design. April 14th;
- Reinforcement Learning for Building Construction and Design*. Rodger Luo, Autodesk AI Lab. April 21st;

Parameter, Material, and Function in Computational Fabrication. Chenyuan Wei, Morphing Program LLC. April 28th.

- 2020 Computational Design Fall Lecture Series "The Digital Mundane"
- On View Mapping Technology: What Difference Did Computers Make?* Moa Carlsson, University of Edinburgh, Oct 21;
- Software Loopholes: Reconfiguring Architectural Labor Hierarchies*, Matthew Allen, University of Waterloo, Oct 29;
- From Data to Form: Generativity and its Structures*, Theodora Vardouli, McGill, Nov 18;
- Softwarization and Design's Socio-Technics*, Galo Cañizares, Ohio State University, Nov 19;
- Situated Computations*, Dec 3. Vernelle Noel (University of Florida), with support from the Steiner Fund at the Frank-Ratchye STUDIO for Creative Inquiry.
- 2019 Computational Design Spring Lecture Series
- Matters of Shape Representation: A Computational Approach to Architectural Heritage*, Mine Ozkar, Istanbul Technical University, April 17;
- Computing Conversation: When, Why, How, Who?* Paul Pangaro Carnegie Mellon University, April 9;
- Relationships Among People*, TeamLab (Tokyo), October 30, co-hosted by the Frank-Ratchye STUDIO for Creative Inquiry;
- Working in Spatial Technology*, Violet Whitney, Sidewalk Labs, November 14;
- Shape Machine*, Thanos Economou, Georgia Institute of Technology, December 5, 2019.
- 2017 Computational Design Lecture Series
- Morphing Matter Across Scale, Discipline, and Context*, Lining Yao, Nov 15;
- Hold that Thought: Designing Interfaces for Embodied Cognition*, Daniel Leithinger, March 5.
- 2016 Computational Design Lecture Series
- Animating Architecture*, Ruari Glynn, December 8.
- Lecture series at PSU 2013 Stuckeman Center for Design Computing Lecture Series
- Feeling the Doing: Transforming Experience Through Design*, Daniel Rosenberg, September 27;
- Building Information: Examples of a Hybrid Modeling Approach for Design Development and Construction*, Josh Lobel, October 18;
- Electrochromism*, Avni Argun, Friday, October 25;
- Modeling of Daylighting*, Rick Mistrick, November 1.
- Workshops at CMU 2020 Computational Design workshop "Agent-Based Modeling: The Art & Science of Emergence." Instructor: Scott Donaldson. Co-organized with Eddy Man Kim. Mar 24.
- 2017 Workshop sessions co-organized with Eddy Man Kim at the Computational Design: Practices, Histories, Infrastructures symposium, Oct. 8.
- Introduction to Mathematical Form-Making.* Joseph Choma;
- Re-imagining Urban Intersections Through Systems Thinking*, Scott Donaldson and Atefeh Mahdavi;
- Build a Miniature CNC from E-waste.* Instructor: Jonah Ross-Mars;
- Meta-Tool: Seeing Spaces.* Dan Taeyoung;
- Cutting-edge Nostalgia: Rhino-Controlled Vintage Pen Plotters.* Carl Lostritto

Workshops at PSU	2013	"Feeling the Doing: Transforming Experience Through Design." Instructor: Daniel Rosenberg. Penn State Department of Architecture. Sep 27.
Other Praxes		
Architecture and design work	2001-	Architectural consultant and embedded researcher Gehry Technologies, Abu Dhabi 2010-2011; UI/UX designer THE MEME, Cambridge MA 2009-2010; Computational Design Specialist Kohn Pedersen Fox, New York 2007; Independent architectural and multimedia design practice in Bogotá, 2001-05.
Selected Multimedia/ web work	2005-	The Observatory of Bogotá 2005; Campus 2004 (with María Mendez); Webarq 2004 (with Carlos Cárdenas, Hernán Velásquez, and María Mendez).
Art/Editorial contributions	2005-	Art (geometric models and 3-D illustrations) of an example of Guastavino (Catalan) vaulting for the book: John Ochsendorf et al., <i>Guastavino Vaulting: The Art of Structural Tile</i> , 1st edition (Princeton Architectural Press, 2010). Art direction and illustration for the book: William J. Mitchell and Federico Casalegno, <i>Connected Sustainable Cities, Connected Urban Development</i> (MIT Mobile Experience Lab Publishing, 2008). Maps for the book: Marcelo Bucheli, <i>Bananas and Business: The United Fruit Company in Colombia, 1899-2000</i> (NYU Press, 2005).
Memberships	2002-	Wilton E. Scott Institute for Energy Innovation at CMU, since 2016; SCS (Society for Modeling & Simulation International), since 2013; 4S: Society for the Social Studies of Science, since 2010; SCA (Colombian Society of Architects) since 2002.
Licensure	2002-	Registered architect in Colombia since 2002.
Op-eds in Spanish	2010-	Daniel Cardoso Llach, Alejandro Morales, and Carlos Mendivil, "Apostarle a la esperanza," <i>El Planeta</i> , June 18, 2010, sec. Opinión.; Daniel Cardoso Llach, "Mockus, El Déspota," <i>Días de Verde</i> , 2010.; Daniel Cardoso Llach, Alejandro Morales, and Carlos Mendivil, "La Esperanza Es Verde," <i>Siglo21</i> , June 2010, sec. Opinión.
Languages		English (proficient), Spanish (native), French (rudimentary).
Other interests		An occasional musician, I have recorded and performed live with different music projects including Altiplano, C. Kubli, and Juan Lanás.