

# Ariel Noyman

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**Media Lab** [media.mit.edu/people/noyman](http://media.mit.edu/people/noyman)

## BIO

I am an Urban Scientist, working to fuse cities and technology. My research is on novel methods of real-time, urban modeling and simulation, with an emphasis on evidence-based collaborative decision-making. In recent years, I have coordinated and deployed a worldwide network of City Science Living-Labs, in Germany, China, Andorra, Vietnam and Mexico to name a few, in an effort to confront my research with real-world urban challenges. My work received awards from the European Commission, the OECD, the Chinese and the Israeli Gov., was featured by The Guardian, 60 Minutes, The New York Times and was displayed in exhibitions, conferences and summits worldwide. Currently he's a PhD candidate at the MIT City Science Group (exp. '22), lecturing at MIT, Northeastern University, and Bezalel Academy in Jerusalem. I completed a Master of Science from MIT (GPA 5/5) and a Bachelor in Architecture (Summa Cum Laude) from Bezalel Academy in Jerusalem.

## RESEARCH

### **CityScope: Urban Insight, Transformation, Prediction, and Consensus**

My work explores the intersection of novel technologies and human-centric processes, coupled to create *a New Urban Process*. It embodies systematic, scalable, evidence-based, and data-driven tools, as part of a comprehensive, long-term, and participatory planning process. This New Urban Process is manifested through the design, development and deployment of **CityScope**, a human-centered, urban modeling, simulation and decision-making platform. CityScope marries urban technology and social discourse through four lenses:

**Insight:** CityScope as an urban observatory, expending on advanced methods in urban and spatial analysis, and focusing on high-resolution, geolocated data. **Transformations:** building iterative urban-transformation and spatial 'what-if' scenarios systems through an iterative and exploratory process. **Predictions:** Evaluation, and prediction of design proposals using methods of urban forecasting, modelling, and simulation. **Consensus:** Using CityScope to construct multi-stakeholder decision-making, consensus and policy processes. Explores Socio-technical systems to facilitate collaborative and distributed decision making in urban planning.

## APPOINTMENTS

2015-17	<b>Research Scientist</b> , City Science Group, MIT Media Lab
2013-14	<b>Graduate Research Assistant</b> , Center For Advanced Urbanism (CAU), MIT
2015-16	<b>Adjunct Professor</b> , Northeastern University, School of Architecture
2008-21	<b>Adjunct Professor</b> , Bezalel Academy for arts & design, Jerusalem, Israel

## PROFESSIONAL EMPLOYMENT

2021	Autodesk Spacemaker.AI <b>Data Scientist</b> , Predictive Analysis
2014	Kohn Pedersen Fox Associates <b>Architectural Designer</b>
2010-12	Chyutin architects, Tel Aviv, Israel <b>Project Manager</b> , Architecture
2008-09	EKA architects, Tel Aviv, Israel <b>Project Manager</b> , Architecture
2006-08	Margalith Architects and Planners, Jerusalem, Israel <b>Architect</b>
2006-13	AN Studio for Architecture, Visualization and Graphic Design <b>Founder</b>

## EDUCATION

Ph.D.	MIT Media Lab: Media, Arts, and Science, Massachusetts Institute of Technology, 2017-2022(exp). GPA 5/5
M.S.	Master of Science in Architecture Studies, Massachusetts Institute of Technology, 2013-2015. GPA 5/5
B.Arch.	Bachelor of Architecture <i>summa cum laude</i> , Bezalel Academy of Arts and Design, Jerusalem, 2003-2008

## TEACHING

2015-21	<b>MIT Media Lab</b>
2021	‘CityScope Process & Methodologies’, City Science Network, International

	2018	MIT Media Lab City Science MAS.552
	2017	MIT Media Lab City Science MAS 4.557
	2016	MAS.S65 Creative Places   Understanding & Enabling Entrepreneurial & Vibrant Urban Hot Spots
2015	<b>MIT School of Architecture &amp; Planning (SA+P)</b>	
	2015	Core II Architectural Design Studio with Prof. Rafi Segal
2015-16	<b>Northeastern University, School of Architecture</b>	
	2016	ARCH7140 Master Thesis Design Studio
	2015	ARCH3170 Architecture, Infrastructure, City 4th year Studio
2008-10	<b>Bezalel Academy for arts &amp; design, Jerusalem, Israel</b>	
	2010	Architectural Design Studio with Prof. Zvi Efrat
	2009	Architectural Design Studio with Arch. Erez Ella
	2008	Architectural Design Studio with Arch. Gal Tevet

### Invited Courses and Workshops

11/20	‘Street Knowledge’ Workshop, Bezalel Academy for arts & design, Jerusalem, Israel, with MIT Media Lab
10/19	CityScope Process, KÉK-Hungarian Contemporary Architecture Centre, Budapest
07/17	CityScope Process, Aalto University, Helsinki
03/17	CityScope Process, Tongji University, China
05/16	‘AutonmouCity’, Jeruslaem Mayor’s office, Bezalel Academy for arts & design, Jerusalem

## SELECTED PROJECT

### MIT Media Lab

2015-present	<b>City Science Network:</b> Helped establish City Science Labs in Andorra, Helsinki, Guadalajara, Shanghai, Detroit, Guadalajara, Ho Chi Minh City.
2015-present	Lead the MIT/HCU CityScience Lab in Hamburg, Germany - a multi-year cooperation agreement between MIT and the Free and Hanseatic City of Hamburg, Germany, and Hafencity Universität Hamburg. Helped grow the lab from 0-35

- 2014-present      **MIT CityScope** an urban modelling, simulation, and decision making platform developed at the MIT City Science group and deployed around the world
- 2016                      President Obama Council of Advisors on Science and Technology (PCAST), Technology and the Future of Cities Report, p. 24
- 2015-2016      **CityScope FindingPlaces** HCI Platform for Public Participation in Refugees' Accommodation Process
- 2019                      FindingPlaces & CityScienceLab at the "City Science Summit", Hamburg, Germany
- 2016                      Shifting Priorities, Finding Places | by MIT Media Lab | MIT MEDIA LAB
- 2017                      Finding Places: HCI Platform for Public Participation in Refugees' Accommodation Process
- 2018                      AR Is Transforming Tech. What Can It Do for Cities?
- 2014-15      **CityScope BRT For Boston** Interactive Urban Tool for Transit Planning
- 2015                      MIT's New Interactive LEGO Urban Tool Brings Transparency to Transit Planning
- 2015                      Centre of Excellence
- 2016                      Boston Bus Rapid Transit (BRT) Community Engagement
- 2016                      MIT + Nuestra Comunidad BRT LEGO Workshops, Boston BRT
- 2018-21      **CityScope Grasbrook** Multi-participant platform for design, collaboration and evaluation of design proposals for the HCH and Herzog de Meuron (HdM), world leading architecture firm
- 2019                      Wettbewerblicher Dialog Stadtteil Grasbrook

## MIT Center For Advanced Urbanism

- 2013-14      **Rebuild by Design (RBD)** 'The New Meadowlands': Winning entry for \$150M HUD multistage planning and design competition following hurricane Sandy in the Tri-State area

## Architectural Projects

- 2010                      **The Museum Of Tolerance, Jerusalem, Israel** with with Chyutin Architects. Winning entry for an international competition and design towards construction of a \$260M campus, including two museum

exhibitions, a children's museum, conference center, a 500-seat banquet hall, an 800-seat lecture hall, a 1000-seat outdoor amphitheater and two viewing theaters

- 2011 **National Institute for Biotechnology** with Chyutin Architects.  
National Institute for Biotechnology, Ben-Gurion University, Beer-Sheva, Israel. \$22M Academic biotechnology laboratory building. Won 2018 National Design Award, Israel.
- 2009 **The Israeli Museum, Jerusalem** with EK-A.  
*EK-A* "Israel Museum, Jerusalem, Israel"  
*Archdaily* "The Israeli Museum, Jerusalem"
- 2008 **Tel-Aviv City Museum (Beit Hai'r)** A 5000 sqft city museum and a cultural center in Tel-Aviv's old City-Hall building
- 2008 **Ordos100, inner Mongolia, China** with EK-A.  
*New York Times* "In Inner Mongolia, Pushing Architecture's Outer Limits"  
*CNN* "Ordos, the abandoned city that's an architectural marvel"  
*Archdaily* "ORDOS 100 #45: Efrat-Kowalsky Architects"  
*Vancouver Biennale* "Ordos 100"

## PUBLICATIONS

### Journal Articles and Conference Proceedings

- 2021 Ronan Doorley, Alex Berke, Ariel Noyman, Luis Alonso, Josep Ribó, Vanessa Arroyo, Marc Pons, Kent Larson  
*Mobility and COVID-19 in Andorra: Country-scale analysis of high-resolution mobility patterns and infection spread* medRxiv 2021.02.18.21251977; doi: <https://doi.org/10.1101/2021.02.18.21251977>
- 2021 Baeza, Jesús López, Julia L. Sievert, André Landwehr, Jonas Luft, Philipp Preuner, Jürgen Bruns-Berentelg, Ariel Noyman, and Joerg Rainer Noennig. "CityScope Platform for Real-Time Analysis and Decision-Support in Urban Design Competitions." *International Journal of E-Planning Research (IJEPR)* 10, no. 4 (2021): 1-17.
- 2020 Noyman, A., & Larson, K. *DeepScope: HCI Platform for Generative Cityscape Visualization* In *Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1–9)
- 2020 Noyman, A., & Larson, K. *A Deep Image of the City: Generative Urban-Design Visualization* In *Proceedings of the Symposium on Simulation for Architecture and Urban Design (SimAUD 2020)*
- 2019 Doorley, R., Noyman, A., Sakai, Y., & Larson, K. What's your MoCho?

- Real-time Mode Choice Prediction Using Discrete Choice Models and a HCI Platform In KDD 2019 UrbComp.
- 2019 Doorley, R. and Noyman, A., Xiong, Z., Alonso, L., Grignard, A., & Larson, K. *RevUrb: Understanding Urban Activity and Human Dynamics through Point Process Modelling of Telecoms Data* In Smart Cities Symposium Prague 2019.
- 2019 Noyman, A., Doorley, R., Xiong, L., Grignard, A., & Larson, K. *Reversed Urbanism: Inferring Urban Performance Through Behavioral Patterns In Temporal Telecom Data* Environment and Planning B: Urban Analytics and City Science, 46(8), 1480–1498
- 2018 Grignard, A., Macia, N., Alonso Pastor, L., Noyman, A., Zhang, Y., & Larson, K. *Cityscope andorra: A multi-level interactive and tangible agent-based visualization* In Proceedings of the 17th International Conference on Autonomous Agents and MultiAgent Systems (pp. 1939–1940).
- 2018 Alonso, L., Zhang, Y., Grignard, A., Noyman, A., Sakai, Y., ElKatsha, M., Doorley, R., & Larson, K. *CityScope: a data-driven interactive simulation tool for urban design. Use case volpe* In International Conference on Complex Systems (pp. 253–261).
- 2018 Noyman, A., Sakai, Y., & Larson, K. *CityScopeAR: urban design and crowd-sourced engagement platform* In CHI 2018 CHI Conference on Human Factors in Computing Systems
- 2017 Ariel Noyman, et al *Finding Places: HCI Platform for Public Participation in Refugees' Accommodation Process* In Knowledge-Based and Intelligent Information & Engineering Systems: Proceedings of the 21st International Conference, KES-20176-8 September 2017, Marseille, France (pp. 2463–2472).
- 2017 Noyman, A., Stibe, A., & Larson, K. Roadmap for autonomous cities: Sustainable transformation of urban spaces Americas Conference on Information Systems (AMCIS)At: Boston, MA, USA
- 2016 Noyman, A., Stibe, A., & Larson, K. Autonomous Cities and the Urbanism of the 4th Machine Age: Should AV Industry Design Future Cities Changing Places Research Group, MIT Media Lab, accessed March, 29, 2017.
- 2015 Alrashed, T., Almalki, A., Aldawood, S., Alhindi, T., Winder, I., Noyman, A., Alfaris, A., & Alwabil, A. An observational study of usability in collaborative tangible interfaces for complex planning systems *Procedia Manufacturing*, 3, 1974–1980.
- 2015 Noyman, A. Power/Structures: the Urban Form of Regulations Massachusetts Institute of Technology

## Book Chapters

- 2021 HafenCity University Hamburg [HCU] and the foundation ZEIT-Stiftung Ebelin und Gerd Bucerius, *Perspectives in Metropolitan Research* JOVIS
- 2021 Raphel Schwegmann / Gesa Ziemer / Jörg Rainer Noennig (Hg.), *Digital City Science. Researching New Technologies in Urban Environments* JOVIS
- 2020 Hubert Beroche, *Urban AI* <https://urban-ai.co>
- 2018 Rafi Segal, *Space Packed: The Architecture of Alfred Neumann* ISBN 9783038600558, 3038600555
- 2018 José Pinto Duarte, *Mass Customization and Design Democratization*, ISBN 9781351117845
- 2015 MIT CAU + ZUS + URBANISTEN with Deltares, 75B, and Volker Infra Design, *New Meadowlands: Productive city + Regional park* <http://www.rebuildbydesign.org/>
- 2010 *What Can We Learn from China? City/state Unit Moving Cities*, ISBN 9789659130405

## EXHABITIONS

- 2021 “Cities/Within”, Venice Biennale, Venice, Italy
- 2020 “HIDW Young Talent”, Hebei International Industrial Design Week (HIDW), China
- 2020 “Champs-Élysées — History & Perspectives”, Pavillon de L’arsenal, Paris, FR
- 2019 “FindingPlaces EOG UAE”, Edge of Government, World Government Summit Dubai, UAE
- 2018 “The Road Ahead”, NYC Cooper Hewitt Museum
- 2016 “Andorra Cityscope”, Smart City Expo World Congress Barcelona, Spain,
- 2016 “CityScope & CityIO Participatory Platforms”, American Planning Association Phoenix, Arizona
- 2015 “Space Packing Architecture: The Life and Work of Alfred Neumann”, Ostrava, Czech Republic and Wroclaw, Poland,
- 2014 “CityScope Play/Ground”, Autodesk University Las-Vegas
- 2014 “Rebuild by Design ”, Cities Exhibited: New York City | Berlin, AEDDES | Copenhagen, Danish Architecture Center | London, Royal Institute of British Architects | New Jersey, Liberty Science Center | San Francisco, SPUR | Boston, Boston Architectural College | Munich | Rotterdam, IABR | Austin, Tx, SXSW Eco | Washington, DC, American Institute of

Architects | Atlanta, American Institute of Architects

- 2011 “Water Towers - New perspectives”, Jaffa Harbor Gallery, Israel
- 2009 “Urban Fantasy”, Shalom Tower Gallery, Tel-Aviv, Israel
- 2008 “Innovative Ideas for Porto Water Tanks”, Faculdade de Arquitectura da Universidade do Porto, Portugal
- 2007 “GreenPeace”, Israeli Architecture Association Center, Jaffa, Israel
- 2005 “Synagogues as Spaces of Equality”, The Museum of Israeli Art, Ramat-Gan, Israel

## INVITED TALKS (SELECTED)

- 03/2021 “From Smart Cities to Street Knowledge” at Shenkar College of Engineering, Design and Art, Tel Aviv, Israel
- 01/2021 “City Science” at Technion, Israel Institute of Technology, Department of Architecture
- 06/2020 “From Smart Cities to Street Knowledge” at BITS of PUBLIC SPACE, TU Delft
- 05/2020 “From Smart Cities to Street Knowledge” at Cal Poly LA Metro, Los Angeles, US
- 05/2020 “Cities Without” at City Science Summit, Elbphilharmonie Hamburg, Germany
- 01/2019 “From Smart Cities to Street Knowledge” at Bar-Ilan University Center for Smart Cities
- 12/2018 “From Smart Cities to Street Knowledge” at Presidential Summit - Israel Ministry of Interior Affairs, Lod, Israel
- 05/2018 “MIT CityScope: A Consensus Machine” at WIEE, Shanghai, China
- 03/2018 “Autonomous Cities: The urbanism of the 4th industrial revolution” at The Society of Autonomous Vehicles, MIT
- 12/2017 “Old, New Cities” at European Commission Director General, Joint Research Center on City Attractiveness, Brussels
- 11/2017 “City Science Network” at Sookmyung University, Seoul, South Korea
- 09/2017 “MIT CityScope: 10 Lessons” at City Science Summit, Andorra
- 08/2017 “Future Urban Mobility” at TheMarker Conference
- 02/2017 “Future Urban Mobility” at Joint Research Center European Commission Talk, EC JRC, Ispra, Italy
- 05/2016 “MIT City Science” at EU ScienceHub: European Commission Director General, Joint Research Center, Brussels



05/2016	“Autonomous Cities” at City Hall, Jerusalem, Israel and Bezalel Academy, Jerusalem
05/2016	“MIT CityScope” at APA National Planning Conference
01/2016	“PowerStructures: The Urban Form of Regulation” at HafenCity University, Hamburg

## ACADEMIC GRANTS AND AWARDS

### Massachusetts Institute of Technology, Cambridge, MA

2017	Full PhD Departmental Scholarship, \$350,000
2013	Full Master Studies fellowship, \$100,000

### Bezalel Academy for Arts and Design, Jerusalem, Israel

2008	Department of Architecture, B.Arch Cum Laude
2008	History & Theory Department, Magna Cum Laude
2008	History & Theory Department, Extraordinary Graduate Student
2008	Excellent thesis project, David Azrieli Foundation, Nomination
2007	4th year scholarship for excellence, Department of Architecture
2007	Award for excellence in 4th year theory studies, History & Theory Department
2006	3rd year scholarship for excellence, Department of Architecture
2006	Award for excellence in 3rd year theory studies, History & Theory Department
2005	2nd year scholarship for excellence, Department of Architecture

## DESIGN & COMPETITIONS AWARDS

2019	“FindingPlaces”, <i>European Union UrbanAct Award</i> , International Competition, GOOD PRACTICE
2015	“New Meadowlands”, <i>U.S. Department of Housing and Urban Development (HUD) “Rebuild by Design”</i> , International Competition, First Place
2011	“Re-Public”, <i>The Union of Architects of Russia (UAR)</i> , RIBA, International competition, Finalist

2010	“Station No.5”, <i>Berkeley University, SPIHS, Bezalel Academy, IL</i> , International competition, Finalist
2009	“The 8th souk”, <i>Magazine architecture A2 Dubai</i> , International competition, Third place
2008	“Tel, Aviv (Aviv’s Mountain)”, <i>Urban Fantasy: New Ideas for ‘Ha’medinah Square’, Tel-Aviv</i> , National competition, 2nd place
2008	“GreenWash”, <i>municipality of Porto, Portugal</i> , International competition, Honorable mention
2007	“Green/Peace”, <i>Ministry of Environmental Protection, Israel</i> , National competition, First place
2006	“Mosaic”, <i>Ministry of Education, Israel</i> , National competition, Third place
2006	“JerusaLame”, <i>Bezalel Academy with Akerstein Company</i> , Students Competition, Third place
2005	“Septum”, <i>‘Kolech’ Organization, Women Forum for equality</i> , National competition, First place

## SERVICE

### Publications Reviewer

2021	Journal of ICT Research and Applications
2020	Journal of Urban Technology
2021	The ACM Conference on Human Factors in Computing Systems (CHI)
'19, '20	EPB - Environment and Planning B: Urban Analytics and City Science Journal
2019	Review Board for Urban Planning (ISSN: 2183-7635)
'16,'17	MIT Media Lab City Science Admissions Committee

### Design Studio Guest Critic

'09,'11,'20,'21	Bezalel Academy, Jerusalem, various panels
2019	30-Minute City: Urban Design Studio, MIT
2018	California Dreamin’: MIT 4.163J / 11.332J Urban Design Studio
'15,'16,'18	Northeastern university, various panels
2017	Urbanism After Extraction, MIT 4.163J Urban Design Studio
2016	Harvard GSD, Prof. Alex Krieger, Jerusalem Urban Design Studio

'07-'08 Tel Aviv University, various panels

### Misc

'20 Mentor, 'In-Vent', the City of Haifa Urban Tech Hackathon

'18 Advisor, 'CityZoom', Israel Smart Cities Community

## TOOLS

<i>Frontend</i>	ES6, React, three.js, TensorflowJS
<i>Backend</i>	Node, AWS
<i>Data Science</i>	(Python) Tensorflow, Keras, SKlearn, Numpy, Pandas
<i>Simulation</i>	SUMO, Unity
<i>Modelling</i>	Rhino & Grasshopper, 3DSmax, SketchUp
<i>Render</i>	V-Ray, KeyShot, Maxwell
<i>CAD</i>	AutoCAD, Revit
<i>Geo</i>	Qgis, ArcGIS, Carto, Mabox, Leaflet, deckGL
<i>Graphics</i>	Adobe CC, Figma, Processing
<i>Fabrication</i>	CNC, 3d Printing

## CREDENTIALS

Registered Architect, Israel

## SELECTED MEDIA

- 2021 *TheMarker (Israel)*. "Eating croissants and shouting at the mayor is not public participation" <https://www.themarker.com/>
- 2021 *Haaretz (Israel)*. "Bike lanes are not the end of it" <https://www.haaretz.co.il>
- 2019 *SmartWorld AI*. "CityScope: the AI for an enlightened town planning" <https://smartworld-ai.com>
- 2019 *Vinci*. "CityScope: AI technology for enlightened urbanism | Leonard, foresight and Innovation by VINCI" <https://leonard.vinci.com/>

- 2019 *De Welt*. “Mit Legosteinen Flüchtlingsunterkünfte finden”  
<https://www.welt.de/>
- 2019 *TheMarker (Israel)*. “Can autonomous vehicles save us from the perils of Suburbia?”<https://www.themarker.com/>
- 2018 *Harvard Kennedy School*. “9 Potential Applications for AR and VR Technology” <https://datasmart.ash.harvard.edu/>
- 2018 *New York Times*. “Building a Connected City From the Ground Up”  
<https://www.nytimes.com/>
- 2018 *European Union - TechPlace*. “CityScope: addressing city challenges with digital LEGO! | TechPlace ” <https://www.techplace.online/>
- 2018 *La Informacion*. “EL MIT ‘SALVA’ INMIGRANTES CON FICHAS LEGO: Gracias al big data sabe dónde deben ser situados en una ciudad”  
<https://www.lainformacion.com/>
- 2017 *TheMarker (Israel)*. “The next trend of luxury apartments”  
<https://www.themarker.com/>
- 2017 *TheMarker (Israel)*. “While everyone waits for the driverless car: Ariel Noyman warns of catastrophe” <https://www.themarker.com/>
- 2017 *Wired*. “Science of Teams: How MIT Media Lab Builds Cities Using Lego and Augmented Reality” <https://www.wired.com/>
- 2016 *GovTech Magazine*. “SimCities: Can City Planning Mistakes Be Avoided Through Data-Driven Simulations?” <https://www.govtech.com/>
- 2015 *Architect Magazine*. “This Week in Tech: MIT Researchers Use Legos to Teach People About Cities” <https://www.architectmagazine.com/>
- 2015 *MIT News*. “New interactive platform for the design of bus rapid transit systems” <http://news.mit.edu/>
- 2015 *Quartz*. “Lego for grown-ups: monochrome set is targeted at architects”  
<https://qz.com/>
- 2014 *The Guardian*. “Lego: can this most analogue of toys really be a modern urban planning tool?” <https://www.theguardian.com/>

## Television

- 2019 *Keshet-Mako (Israel)*. “Hands-Off (the Wheel)” <https://www.mako.co.il/>
- 2019 *60 Minutes*. “MIT Media Lab: Making ideas into reality”  
<https://www.cbsnews.com/>

## Radio

- 2019 *OpenOffice Podcast*. “How City Science empowers our future - Ariel Noyman, city science researcher at MIT Media Lab” <https://soundcloud.com/>
- 2018 *EretzFM Radio*. “Ariel Noyman - Interview” <https://soundcloud.com/>

## Architecture

- 2015 *ArchDaily*. “Space Packing Architecture: The Life and Work of Alfred Neumann” <https://www.archdaily.com/>
- 2012 *ArchDaily*. “Station 5 / Ariel Noyman” <https://www.archdaily.com/>
- 2010 *ArchDaily*. “Museum of Tolerance in Jerusalem” <https://www.archdaily.com/>
- 2010 *ArchDaily*. “ORDOS 100 #45” <https://www.archdaily.com/>
- 2010 *LA Times*. “New designs revealed for Museum of Tolerance in Jerusalem” <https://latimes.com>
- 2011 *ArchDaily*. “Atlantic City Holocaust Memorial proposal”, Ariel Noyman and Ruth Kedar, <https://www.archdaily.com/>